

# Marine Review

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*Every eye on the S. S. President Hoover after Mrs. Hoover christened the ship at Newport News, Dec. 9, 1930*

## « EDITORIAL »

### Building a Merchant Fleet for Profitable Operation

**T**HAT legislation can be of practically immediate and direct effect in accomplishing the purpose set forth is strikingly illustrated by the launching on Dec. 9 of the first of four transoceanic liners for the Dollar line's service on the Pacific. It is a peculiarly significant event in the maritime history of the United States because this vessel, now afloat and soon to be completed, is the largest merchant ship ever built in an American yard. It was the purpose of the merchant marine act of 1928, known as the Jones-White law, signed by President Coolidge in May of that year, to encourage the building up of a merchant marine. Two important articles of this law were calculated to accomplish this end and subsequent events topped by the launching of this new magnificent liner have given proof of the effectiveness of these measures.

The first of these is the provision for mail

contracts in routes considered essential in building up foreign commerce and cultural relations. Unlike previous mail contracts in other shipping bills, the rates are higher and a ten-year tenure is specified which cannot be altered by any subsequent legislation. A contract once awarded stands for the period designated subject only to adherence to its terms by both parties.

The second feature of the merchant marine act of 1928 is the provision that 75 per cent of the cost of building new ships, called for under the mail contracts and approved in design by the government, will be loaned to responsible operators at a rate of interest of about half what would have to be paid in the open money market, without additional cost of financing.

It is apparent that these two provisos of the law have brought on a real revival in shipbuilding. In other words the legislation sponsored by proponents of the idea that the United States should have an overseas merchant marine has had in operation an even greater practical effect than might have been hoped for. This surprising practicability of the law has



had the effect of making some people wonder if there isn't a nigger in the woodpile somewhere.

A foreigner without sympathy for our national aspirations for a merchant marine will say: "Of course you can build ships, fine large able ships, with Uncle Sam paying the bill. Anyone would be a fool or doesn't know conditions in the United States who believes that you do not have the skill to build ships that will compare favorably in engineering and in architecture with ships built anywhere else. But have you considered the problems and burdens of profitable operation of these ships, once they are built? Here again, it is readily admitted that you can keep them on designated essential routes subsidized by Uncle Sam in the form of mail pay. This can only be temporary, however. You say the contracts are fairly long for periods up to ten years. What's going to happen after this period? Is there any assurance that your government will continue to pay money to have your flag represented in these routes? We think you are heedless and that you are rushing into something, the seriousness of which you do not appreciate. When this is all done and your enthusiasm dies it will go down in history as a great failure, as one of the most ambitious attempts ever recorded of paternalism in government in trying to change the free currents of business. Having learned a costly lesson you will again resume the transport of your commerce in foreign bottoms."

We must consider the point of view expressed by this mythical foreigner concerning our attempt to get into a field in which he would like to be left undisturbed. How rash are we? Are we rushing into this thing with sufficient planning and forethought for the future? The answer must be a prayer that we have wise men in control of the distribution of these sums for promoting our merchant marine. Also, every agency of the government should be used to facilitate and to promote trade and commerce on the essential routes favoring our own ships in every legitimate way as carriers. Every chance must be given for the efficient and skillful American operator to make good.

We are building ships and in the next five years to come we will be building more, including probably two super liners for the Atlantic. The prophecy of the unsympathetic foreigner must not be allowed to come true. Every American should work toward this goal, and if need be Uncle Sam will continue to stand by to see it through because we cannot afford ever again to go back to the position we were in when the World war came.

## First Transatlantic Liner

**A**LMOST coincident with the launching of the great ship referred to above came the keel laying ceremony for the first of two even greater ships. When the keel is laid every assurance can be felt that the ship will in due course be completed. Never before in an American shipyard has a merchant vessel of this great size been laid down. The new vessel will rank in size and speed with some of the finest and best known vessels on the North Atlantic. The gross tonnage, for instance, is 30,000 tons. The length is 705 feet and the beam is 86 feet. Compare this with the PARIS, for instance, of something over 34,000 gross tons, 735.4 feet in length, and 85.3 feet in beam. The HOMERIC, also a little over 34,000 gross tons, is 751 feet in length with 83½ feet in beam.

In luxury and comfort of appointments and in all other features, including safety, affected by modern advance in engineering and architecture, the new United States liners will undoubtedly be superior to any ships near their size now afloat. It is a fine beginning for the United States lines, but the effort to co-ordinate all of the factors making possible the building of two super liners must be continued with all possible vigor. We must not rest on any program which leaves the American flag second to any other on the North Atlantic.

## Training American Officers

**T**HE shipping board is doing many things to promote a well found and an efficient merchant marine. Under the leadership of the present chairman the board has put into vigorous action several rather nebulous suggestions made by the law under which it was created and subsequent marine legislation. For instance the board has done and is doing some very fine work both in research and practical application to advance the art of shipbuilding and marine engineering. The diesel program is a case in point, as is the introduction of practical means to use pulverized coal for fuel. Experiments have been made at the model basins in the navy yard at Washington and Ann Arbor, Mich., on hull forms and propeller characteristics.

But no work that the board has undertaken is of more importance than the attempt now being made to establish practical methods of training officers for our merchant marine. We are trying to build good ships. To be success-



ful these ships must be operated by officers of courage and intelligence who know their business.

An approach to the problem has already been made by Admiral Cone in sending out a list of questions intended to develop worthwhile opinion as to the best methods of going about the training of young men as officers of our merchant marine. Though the time is brief the matter will probably be discussed at the coming fourth national conference on the merchant marine to be held in Washington, Jan. 21 and 22.

What other nations do in training officers for their merchant marine may not be what we want to do, but their methods might be studied with profit. There should be a combination of courses of technical study and practical experience including a period of time at sea in a sail rigged vessel. The selection of applicants for training as merchant marine officers should be on such a high plane that it will appeal to vigorous and alert youngsters of good character looking for a real career. In any case the purpose of the shipping board's investigation is excellent and it is to be hoped that some practical measures may be developed and action taken to put them into effect as soon as possible.

## Save Diesel Exhaust Heat

**A**TENTION has recently been called to the waste heat recovery possible in diesel engine ships. An article on this subject published in *MARINE REVIEW* for June, 1930, related the saving possible in several specific instances as follows:

In a vessel with a diesel engine of 2000 horsepower a waste heat boiler evaporated .84 pound of water per hour per brake horsepower from water at 60 degrees Fahr. to steam at 100 pounds pressure without any auxiliary firing. Another practical example is a vessel with a 1600-horsepower engine in which the exhaust gas boiler generated steam at 90 pounds with which a 12½-kilowatt dynamo was operated continuously during the voyage; also as and when required other auxiliaries in the shape of fuel transfer pump, compressor, purifier, distiller and evaporator. In still another case of a diesel ship with two 2500-horsepower engines, two waste heat boilers, each generated 1000 pounds of steam per hour with exhaust gases not exceeding 500 degrees Fahr., the working pressure of the boilers being 100 pounds. A thousand pounds of steam per hour at 65 pounds pressure was developed on a diesel vessel with two engines totaling 3300

horsepower. The working pressure was 65 pounds and the gas temperature was in the neighborhood of 360 degrees Fahr.; higher pressures of course being obtainable with higher gas temperatures. The steam so generated is always useful. The dynamos can be driven and then the exhaust steam from them can be used in evaporators, for heating or for turbine blowers, if these are installed.

These specific examples of the great usefulness and increased economy possible in diesel ships when proper means are taken to turn the waste heat of the engine exhaust into power clearly show that this feature should be given serious attention in all future designs. It is quite possible that an intelligent consideration of this problem will add greatly to the advantage of the diesel drive even to the extent of its becoming a determining factor in the selection of this type of main drive.

## New Legislation Proposed

**A**LL of the recommendations presented by the shipping board to congress and included in its fourteenth annual report are intended to remove existing handicaps in the competition of American steamship companies with foreign flag ships. One of these calls for a clarification of the present law so that any purchaser of a shipping board line will be assured of a mail contract. This should be done as it is evidently the intent in spirit of the Jones-White law. It is unfair that there should be any discrimination between those who have bought shipping board lines and received mail contracts and prospective future purchasers of remaining lines. Also it would have, it is believed, a favorable effect in the sale to private owners of those lines still operated for the board.

Mail pay for vessels in excess of 24 knots speed should be increased to offset the difference in cost of operation. The board is now studying the operating costs of high speed vessels and will be able to advise congress on equitable rates of pay. It is hopeless to figure on the building and operation of super liners of greater speed than the *BREMEN* and *EUROPA* and of a speed equal to that of the new *Cunarder* being laid down unless an adequate revision is made of present rates.

Other recommendations of importance to the welfare of the merchant marine are contained in the report with all of which we are in agreement with the single exception of the proposal that American lines which operate foreign flag ships in competition with American vessels



should not be entitled to receive mail contracts. This is too broad and too sudden. Before any such legislation is enacted the whole subject should be carefully studied. Each case in the meantime should be decided on its merits. The law is clear now and rightly so that no company can place any ship built abroad after a certain date, now long since passed, in a service calling for mail pay. This inevitably means new ships built in the United States.

It would be unfair to penalize an American company in every way loyal to the country because it had in its fleet certain foreign flag vessels acquired before the present law became effective. In this instance the stand taken by Postmaster General Walter F. Brown in a recent address in New York would seem to best serve the immediate interests of the American merchant marine. He said in part: "To disqualify these companies from receiving ocean mail contracts would not, it seems to me, give them a sufficient inducement to build American flag ships. It would seem that for the present we ought to be just as willing to have an American company replace a foreign flag vessel with an American ship as to have such a company operating only American ships build an additional vessel. Perhaps the time will come when the government can safely require its ocean mail contractors to operate exclusively under our flag. But it is the hope of the post office department that until we have progressed much further on the road to an adequate merchant fleet, congress will not insist upon any such restriction."

## Keep Shipbuilding at Home

**A** LARGE American oil company recently placed an order for nine large oil carrying vessels in German and Italian shipyards. In addition there are at least seven other tankers building abroad for American companies. The National Council of American Shipbuilders in reviewing the reasons for placing so large an order in foreign yards points out that these 16 tankers if built in the United States would cost approximately \$34,500,000 and would give employment to 18,400 men for one year. Only one third of the available ways in the United States are now occupied.

The contracts in Germany and Italy it is reported were placed at about \$77.00 and \$66.00 a deadweight ton respectively, while in the United States the same vessels would cost not less than \$135.00 a deadweight ton. A very interesting comparison is also shown between

wages and staple food prices abroad and in the United States. This shows that wages in the United States are double those in Great Britain; triple those in Germany and three and one-half times those in Italy; while relative food costs of weekly rations using United States as unity is, Great Britain 0.74; Germany 0.81 and Italy 0.85.

The statement then suggests that our shipping policy be so shaped that American companies can afford to build their cargo carrying vessels for foreign trade here. The cost is about 50 per cent greater than in Great Britain. Since we have not hesitated to provide protection of even more than 50 per cent for the development of many of our internal industries, why not provide similar protection for shipbuilding as it is a factor in the promotion of the welfare of all of our industries through the creation and building up of our foreign markets.

## A Hundred Years of Service

**T**HE Hydrographic office of the navy has completed 100 years of invaluable service to navigation. During this long period the work done by this office has saved thousands of lives and untold millions of property. Without it, moreover, the progress of civilization, as measured by safer and faster lines of communication between distant parts of the world and the unfolding of knowledge by exploration, would have been comparatively slow and hesitant.

The office had its beginning on Dec. 6, 1830, when a depot was established in Washington by the navy department for the care and issue of the charts and navigational instruments furnished United States naval vessels. Its mission, not perhaps so clearly understood when it was founded, but now thoroughly established, is to collect, digest and issue timely information to afford maximum navigational safety and facility to ships on the seas and to aircraft operating over sea routes. In the building up of this vast store of information and scientific knowledge the Hydrographic office has had the active co-operation of the navies, merchant marine, aviation, steamship interests and scientific institutions throughout the world.

In its work there are no boundary lines of nations and no rank except intelligence. Universal and open to all are the benefits of its accumulated information. The Hydrographic office might be said to typify in its highest form the unselfish pursuit of knowledge for the good of all mankind.



# Keel is Laid for United States Liner

## First of Two Transatlantic Vessels

### Largest American Ship Laid Down

LAYING the keel for a ship in a first class shipyard in the United States means inevitably that that ship will in due course sail the seas. That is why it may be marked as of old as a significant event in the building of the ship. On Dec. 6 at the yard of the New York Shipbuilding Co., Camden, N. J., a notable group of guests of the United States lines and of the shipyard attended keel laying ceremonies for the first of the two 30,000-ton Atlantic liners. Among those attending were Senators Dwight W. Morrow, Wallace H. White Jr., and Wesley L. Jones, sponsors of the Jones-White bill, and Chairman T. V. O'Connor of the United States shipping board. Paul W. Chapman, president, and Joseph E. Sheedy, executive vice president of the United States lines and Clinton L. Bardo, president of the New York Shipbuilding Co., represented the hosts.

As a matter of fact the shipyard had already made good progress not only in the keel laying but in bolting into place much of the bottom plating throughout a considerable length of the vessel. A section of double bottom floors and centerline keelson was swung into place by an overhead crane. Rivets were driven by means of an air driven compression yoke riveter. Each senator, the

chairman of the shipping board and the presidents respectively of the owning and building company drove a rivet into the top bounding angle

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WE believe foreign domination of carriers at sea is not to the best interests of our agriculture and industry—it could be destructive of our markets—our balance of trade—our prosperity.

We believe our commerce must be independent and our merchandise mobile, under our own flag, throughout the seven seas.

We believe merchant marine strength is, in time of peace or war, as necessary to the future security of the United States of America as are navies and armies.

We believe the Stars and Stripes are of inestimable value in the promotion of peace and trade relations wherever unfurled—on land or on sea.

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*From speech by P. W. Chapman  
President United States Lines Inc.*

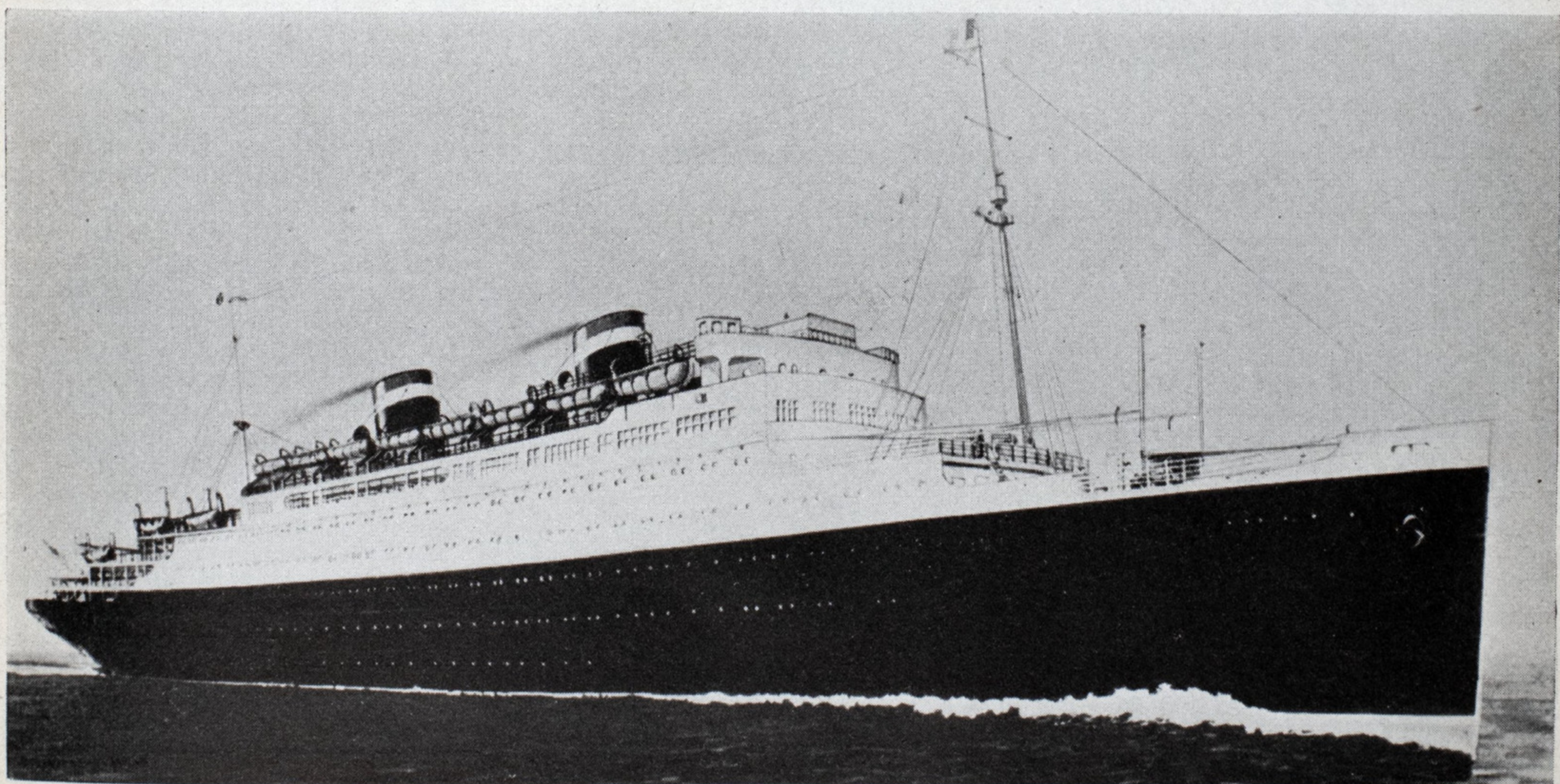
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to one of the floors. The work was so easy and clean that Senator Dwight W. Morrow spurned the use of the white duck gloves offered him. The executive vice president of the United States lines, Joseph E. Sheedy, passed rivets for the distinguished riveters.

After the ceremony of riveting at the yard, a luncheon was held at the Walt Whitman hotel in Camden at which the officials who did the riveting were the speakers, Mr. Sheedy acting as toastmaster. The speeches all stressed the necessity of an adequate merchant marine because without it the United States will be handicapped in its foreign trade and in national defense.

Contract for the two ships was signed last May and preliminary design work commenced at the plant immediately. The keel for the second vessel will be laid in March on the adjoining ways and both ships are to be delivered in 1932. The first one in July and the second in November. These ships will rank not only as the largest merchant vessels so far laid down in an American shipyard but also among the largest vessels now operating on the Atlantic. The estimated gross tonnage will be slightly over 30,000. Designed deadweight is 12,000 tons. The propul-

(Continued on Page 33)



*Artist's Drawing of the New United States Liner, Keel of which was laid Dec. 6, 1930 at Camden, N. J.*



# S. S. PRESIDENT

## At Newport News Yard

### First of Four Dollar Line

*Mrs. Herbert Hoover and party at the launching of  
the S. S. President Hoover at Newport  
News, Dec. 9, 1930*



IN A CEREMONY marked by simplicity and dignity in keeping with our republican traditions, Mrs. Herbert Hoover, wife of the President, christened the first of the two new \$8,000,000 turbine electric liners for the Dollar Steamship lines, the PRESIDENT HOOVER, at Newport News, Va., Dec. 9. The day was clear and cool with bright sunshine and a large crowd witnessed the event. Mrs. Hoover was accompanied by her little grandson, Herbert Hoover III, and his mother as well as naval and military aids. A unique feature of the ceremony was the use of a bottle of waters collected from the seven seas over which the Dollar lines' round-the-world fleet operates. The launching took place shortly before noon.

No nation can be great on the seas without sentiment for ships which are the instruments of such greatness. No man or woman who witnessed the launching of this great ship could be unmoved by its significance in our future maritime history. This vessel is the largest and in every respect the most modern and luxuri-

ous merchant vessel ever launched in an American shipyard. Furthermore, she is the first of a fleet of four such vessels included in the building program now under way and projected

#### The S.S. President Hoover General Particulars

Length over all, feet.....	653
Length on waterline, feet.....	630
Length between perpendiculars, feet.....	615
Beam, molded, feet.....	81
Depth molded to shelter deck, side, ft.....	52
Depth molded to upper deck, side, ft., in.....	42 6
Load draft, designed, ft.....	32
Draft for scantlings and subdivisions, ft.....	34
Displacement at designed load draft (tons).....	33,800
Gross tons, estimated.....	23,000
Deadweight capacity at 34' draft (tons).....	17,400
Cargo, general (cubic feet).....	650,000
Cargo, refrigerated (cubic feet).....	70,000
Propulsion, Turbo Electric—twin screw, S.H.P.....	26,500
Shaft horsepower, maximum.....	27,200
Cruising speed (knots).....	21
Fuel capacity (tons oil).....	6,000
Boilers (watertube Babcock & Wilcox).....	12
First Class Passengers.....	320
Special Class Passengers.....	140
Passenger accommodations, other classes.....	800
Total passenger carrying capacity.....	1,260
Crew.....	300
Classification... American Bureau of Shipping Subdivision... British Board of Trade, 1928 rules	

for the Dollar Steamship lines. In safety, speed, beauty and comfort of public rooms and passenger quarters and in economy of operation, these vessels will compare favorably with the very finest under any flag. It has been the common habit, not only abroad but at home, to be rather patronizing about anything American afloat. This will no longer apply when the S. S. PRESIDENT HOOVER enters the transpacific service. The discriminating traveler will quickly recognize her excellence.

The new liner is a twin screw vessel with slightly raked stem and semi-cruiser stern and with two stacks and masts. There are nine decks in all. For convenience principal particulars are detailed separately in an accompanying table. The total passenger capacity in all classes is 1260. Quarters are arranged for a crew of over 300. Interior arrangements include elevators, swimming pools, sand beach, gymnasium, children's playroom, soda fountain, veranda cafe, smoking rooms, library, private dining rooms, tea rooms, music and

(Continued on Page 24)



# HOOVER LAUNCHED

—Sponsored by Mrs. Hoover

—Twin Screw Turbine Electric

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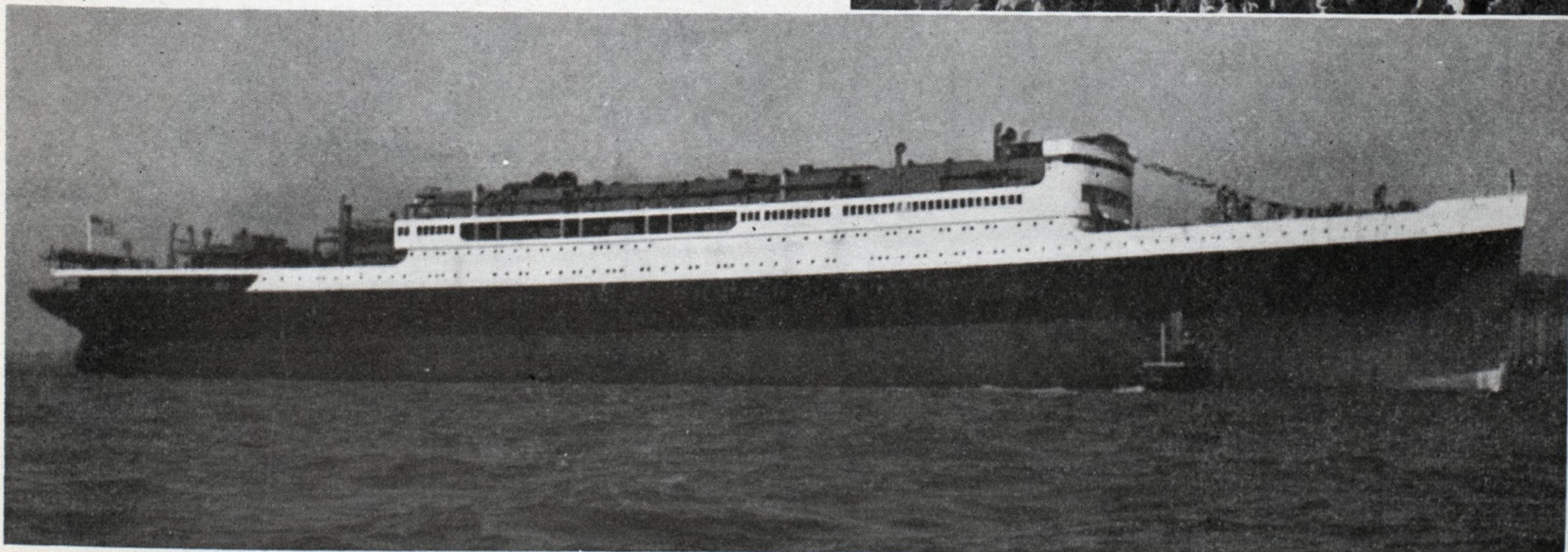
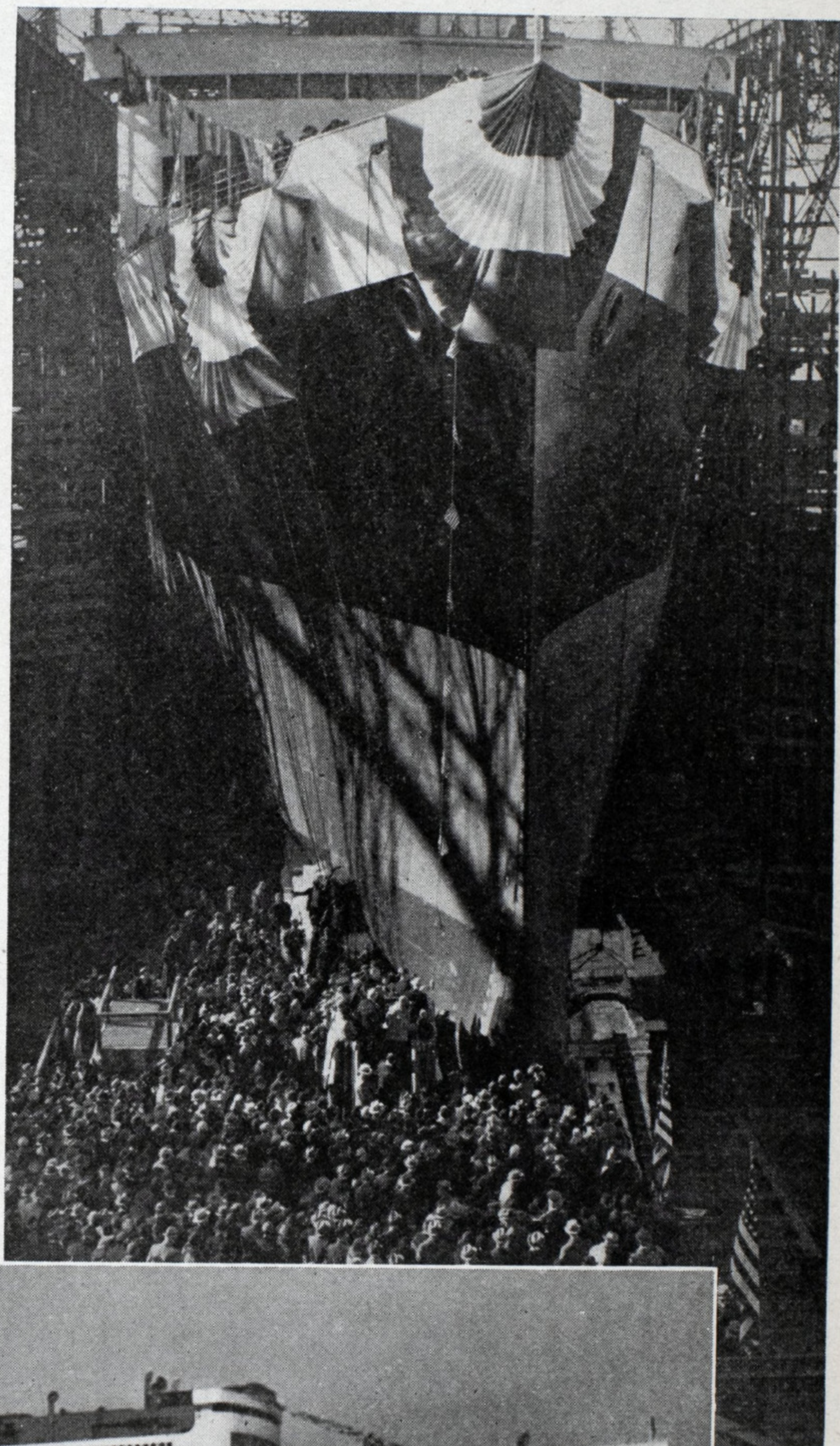
## Remarks Made by R. Stanley Dollar

IN launching the President Hoover today, we feel that we are testifying to our staunch confidence in the triumph of the American merchant marine. Under the stirring inspiration, the sage guidance and the wholehearted support of the United States government, the day is not far off when American shipping men will be able to bring the honor of supremacy of the seas to our flag and to hold it there forever.

Thirty years ago my father, Capt. Robert Dollar, bought his first steamer—the Newsboy—just 120 feet long, 30 feet beam and 9 feet deep. She had a crew of 11 men.

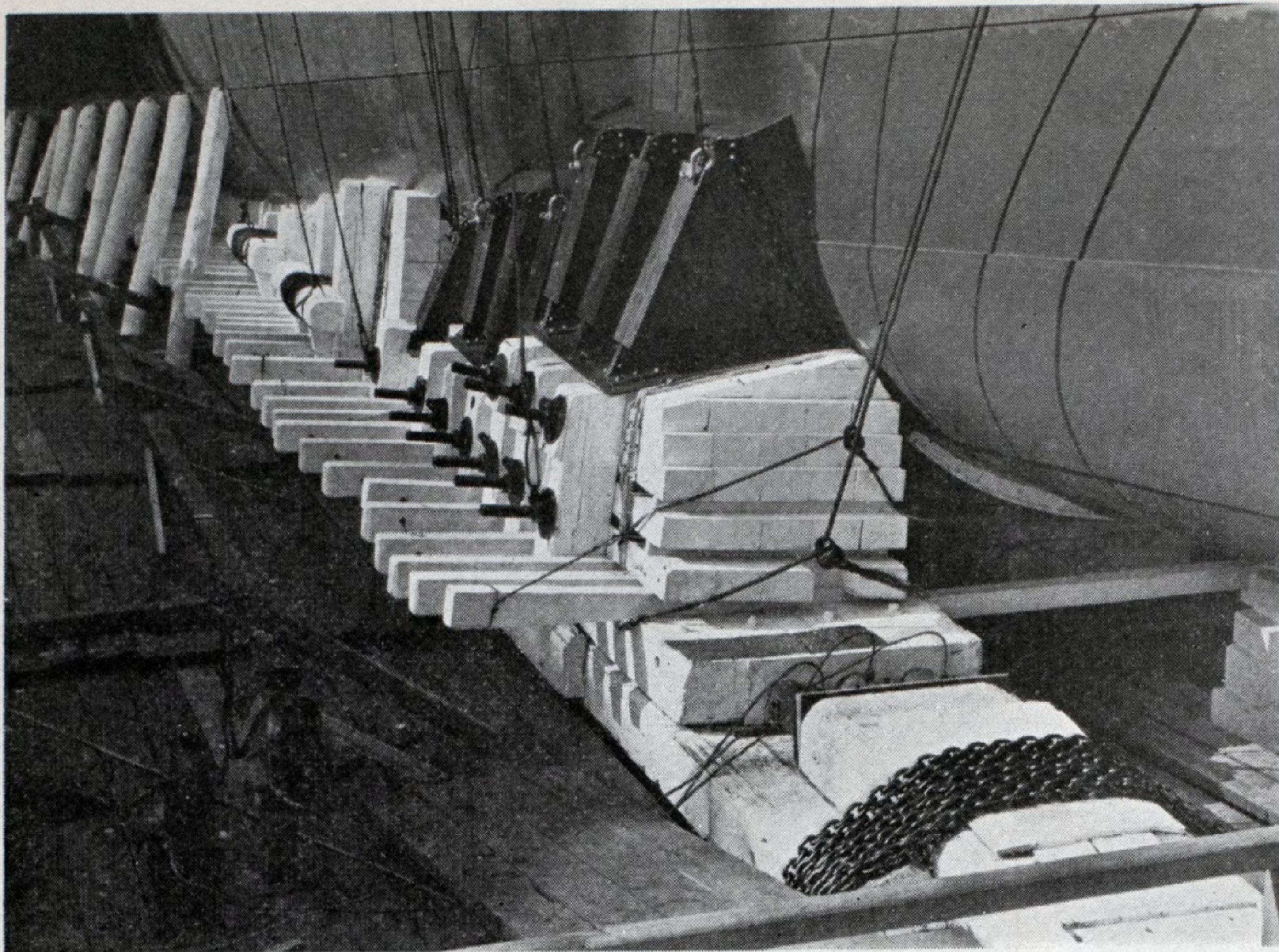
Thirty years ago when we owned only the Newsboy, my father's vision pictured the President Hoover and the fleet of liners we operate to the Orient and round-the-world. Today, he is far out on the coast of Asia on his 37th business voyage to the Far East (and, remember, he's only 87 years old.)

Mrs. Hoover, we well realize the honor paid us today in your presence here as representative of the greatest nation beneath the sun. We beg that you give to this ship the name of your illustrious husband. We beg that you release her from the ways that she may find place on the seas, there to do honor to her flag and to her country through many long years to come.



*S. S. President Hoover in the James river just after launching Dec. 9, 1930. Largest merchant ship so far launched in the United States. For the Dollar line service. Above—The S. S. President Hoover just before Launching at Newport News, Va.*





*Fore poppets of the S. S. President Hoover shortly before launching at the yard of the Newport News Shipbuilding & Dry Dock Co.*

dance salons, talking picture theater, shopping lobby, broadcasting system, and stock exchange rooms, etc.

Four de luxe suites consisting of a sea veranda, living room, bedroom and bath are to be located amidships on the first deck devoted to passenger accommodations. These suites will be done in the best manner possible under the direction of one of the country's leading interior decorators. All of the public rooms and staterooms including furnishings and fittings will be of the finest design and quality.

#### **A Transoceanic Liner**

The S. S. PRESIDENT HOOVER is the first electric passenger liner built in the United States for transoceanic service. This vessel and her sister vessel, to be launched in February, are being built by the Newport News Shipbuilding & Dry Dock Co. These two ships will be completely electrified, using the turbine electric meth-

od of propulsion and using electricity for every other possible duty aboard ship, including lighting, the operation of auxiliaries and the use of electric heat for various purposes.

The decision to employ electric drive was the result of investigations and studies in collaboration with the General Electric Co. over a period of two years. The power plant of the S. S. PRESIDENT HOOVER will consist of two 13,600 shaft horsepower General Electric turbines running at 2500 revolutions per minute and driving two alternating current General Electric generators, each having a continuous rating of 10,100 kilowatts, three-phase, 4800 volts. These generators will supply electricity for driving two 13,250 horsepower, synchronous induction motors each connected to one of the two propellers shafts turning at the rate of 133 revolutions per minute. Excitation and power for operating auxiliaries and

lighting is to be furnished by four 500 kilowatt, 240 volts, compound wound, direct current General Electric generators of the geared type.

Steam will be supplied by 12 Babcock & Wilcox marine watertube high pressure superheated steam boilers burning oil. A good fuel economy is anticipated.

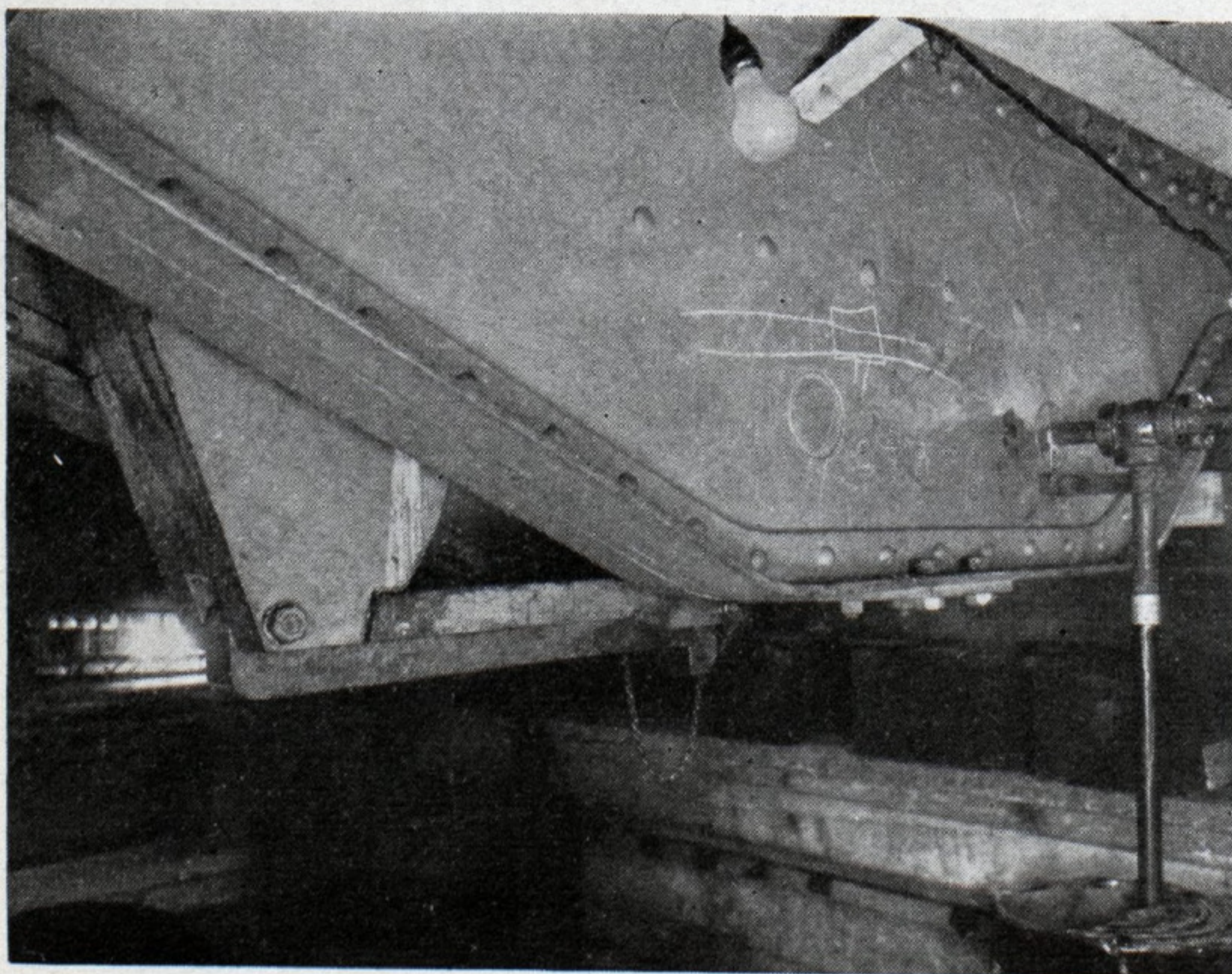
All watertight compartment doors throughout the ship will be electrically controlled direct from the bridge. In event of an accident of any kind all watertight doors can be closed within from 15 to 30 seconds. Subdivision will be in accordance with the British board of trade rules for 1928. All requirements of the international convention for the safety of life at sea will be met. The vessel is to be fitted with all of the latest safety devices including gravity davits for lifeboats, long range wireless, radio direction finder and fathometer. The most modern navigating machinery will be fitted including United States navy type compasses, Sperry gyro compasses and other devices, searchlights and numerous navigation aids.

One of the features of this vessel will be a garage to accommodate 100 cars. A machine shop to permit ordinary repairs and servicing of automobiles will be an adjunct of the garage unit. Cars will be driven aboard through side ports.

#### **Elaborate Launching Arrangements**

The PRESIDENT HOOVER was launched from one of the twin semi-submerged ways, on which in recent years most of the large vessels at the Newport News Shipbuilding & Dry Dock Co. have been built. These ways have at their outboard ends large caissons and are therefore virtually partial dry docks. This permits vessels to be built at considerably lower elevations than is the case with the usual type of outboard ways, thus greatly reducing the distance they have to slide before being fully water borne at launching. Another advantage is that it permits all of the groundways being set in the "dry," instead of having in the neighborhood of 200 feet of their length under water. As a matter of fact the groundways on which the PRESIDENT HOOVER was launched have been kept permanently in place since they were first placed for the launching of the S. S. CALIFORNIA in October, 1927. This feature materially facilitates launching preparations and lessens the cost as well. The fact that the after end of the ship is below the water level makes it necessary to replace the keel blocks in that vicinity with trip shores and to do some wedging up aft before the water is fully admitted to the basin and the caissons removed, which is generally about two hours before the actual launching.

The releasing arrangement used in the launching of all vessels at this



*Hydraulic Trigger Used in Launching the S. S. President Hoover. There is a Trigger Mechanism for Each Way. The Capacity of Each Trigger Used in This Launching is 610 Tons*



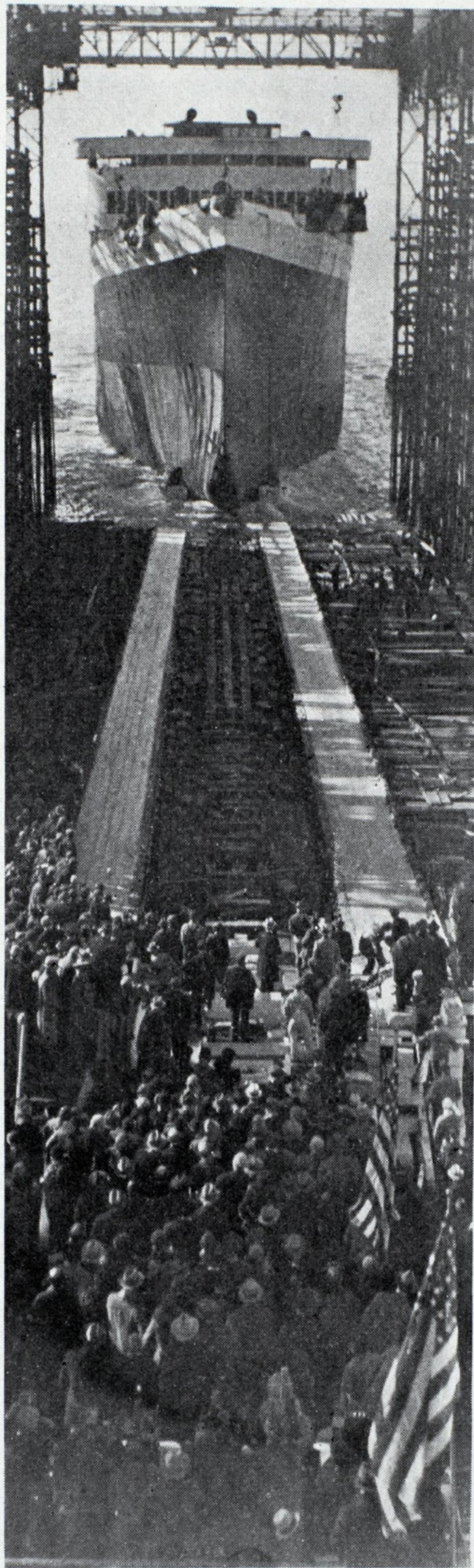
yard is the hydraulic trigger type and in the semi-submerged ways there are trigger pits provided for their installation. There is a trigger mechanism for each way; the ones used in this launching each have a capacity of 610 tons. The hydraulic cylinders are 14 inches in diameter and the mechanisms are installed between two sections of the groundways, to which they are rigidly attached. The trigger bears against a cast steel shoe fitted at the end of one of the sections of the sliding ways. While the capacity of these triggers is sufficient to hold a very large vessel even after all its weight is being supported by the packing on the sliding ways, as a matter of precaution dog shores are fitted at some convenient location aft of the triggers and these are cut out just before the hydraulic triggers are released. Due it is believed to the unusual coolness of the night before the vessel did not move when first released. After a short delay and with the aid of jacks the ship started and the launching was carried out in good order.

### Substantial Ground Ways

The ground ways for this launching were 770 feet long and 84 inches wide. They extended from a short distance above the stem to the caisson, at which point there was 18 feet 6 inches of water over them. With this long extension of ways and depth of water pivoting took place before the center of gravity passed the end of the ways, consequently there was no tipping moment at all about the latter, which is another favorable feature of the submerged ways. The ways are constructed of 12 x 12 inches yellow pine, are sheathed on the upper surface with 3 x 12 inches oak, and have a 4 x 16 inches oak ribband extending about 4 inches above the sheathing. They are made in seven sections, securely joined to each other by means of steel buttstraps. The distance between ribbands, in this case, was 30 feet 1 inch forward and 30 feet 5 inches aft. The ways were laid on an uniform  $\frac{5}{8}$ -inch longitudinal grade and a transverse inclination of  $\frac{3}{8}$ -inch per foot. Substantial shoring was fitted at intervals throughout their entire length, to prevent any displacement of ways prior to, or during the launching process.

The sliding ways used are constructed the same as the groundways, but without a ribband. They are in five sections, joined together by steel buttstraps, with through toggle pins. The thickness is 15 inches, the length about 560 feet and the width 72 inches. Joggled wedges spaced approximately every 20 feet were used to hold the sliding ways about 2 inches clear of the ribbands on the groundways and were removed shortly before the launching. To prevent pressure coming on the greased ways before the proper time "grease

irons" approximately  $\frac{5}{8}$ -inch thick, 7 inches wide and 9 feet long were placed between the sliding and the ground ways at about 15-foot intervals. Those aft in way of trip shores were removed the day before, and the



*S. S. President Hoover first Dollar liner, twin screw turbine electric drive, launched at Newport News Dec. 9, 1930*

remainder on the morning of the launching.

The photographs accompanying this article show the general type of the bow sections of the cradle. In order that the fore poppets might be located within a reasonable distance of the stem three plate saddles with extension brackets were fitted to provide a substantial support for them. The No. 1 saddle was 36-pound plate, 78

inches wide, fitted with three heavy brackets; No. 2 was 72 inches wide, also fitted with three brackets; and No. 3 was 26 inches wide, fitted with one bracket. Wood packing was fitted between the saddles and the hull up to about the bottom of the brackets and cement was fitted where the brackets had considerable flare. The fore poppets were built up in the usual manner and two rows of white pine crushing strips were fitted for a distance of about 20 feet in order to distribute the pivoting pressure over a greater area. Tie rods only were used to hold the fore poppets together, in conjunction with oak strongbacks at each saddle. The main packing was in mine sections, each firmly lashed at 5-foot intervals to prevent disassembling when they are withdrawn. At each end of each section angle clips were fitted on the inside of the packing to prevent its being displaced outboard during launching. Tie rods and frapping at the forward and after ends were also fitted for that purpose. The after poppets were built up with alternate longitudinal and transverse layers of  $7\frac{1}{2}$  x 12 inches pine, there being two longitudinal layers to each transverse one. The latter had alternate open spaces where the height of the packing was sufficient to permit such an arrangement.

The launching lubricant was similar to that used in the launching of other large vessels at the Newport News yard. It consisted of an initial layer of stearine above which were applied generally three other layers of tallow and grease. The initial layer of stearine varied from one to four coats, increasing by sections from forward aft, the heaviest coats being applied in the pivoting region.

### Oak Wedges Are Used

The wedging up was done by means of tapered oak wedges located on frame and half frame spaces throughout the length of the packing. All wedges were 6 inches wide by 9 feet long and had a taper of approximately 1 inch per foot. There were three rallies on the wedges.

During the construction of the vessel it rested on 112 keel blocks spaced 5 feet apart and A frames were used under the stern. Alternate solid pine and collapsible oak blocks were used for about 60 per cent of the length from forward, and solid pine blocks aft of that point. About a week before the launching the alternate solid blocks, in way of the collapsible ones, were replaced by quick-releasing sand blocks. A few days before the launching the 30 solid blocks aft were replaced by 15 trip shores, this being done because that part was below the water level. The use of collapsible and sand blocks saves considerable time during the launching period as it leaves a minimum of solid blocks to be cut out. The cutting out of the

*(Continued on Page 44)*



## Commodore Cunningham to Leave U. S. Lines

COMMODORE Harold A. Cunningham, master of the steamer LEVIATHAN, flagship of the United States lines, has resigned and will join the Standard Shipping Co., New York, in an executive capacity. He will remain master of the LEVIATHAN until she lays up for her semi-annual reconditioning in February.

"I sincerely regret the resignation of Commodore Cunningham, the senior ranking officer of the American merchant marine," declared J. L. Sheedy, executive vice president of the United States lines. "For the past three years he has been master of the LEVIATHAN and prior to that he commanded a number of other ships including the GEORGE WASHINGTON. He has enjoyed an enviable record as a navigator and although a strict disciplinarian, every man who served under him held him in the highest regard and esteem. We are sorry to lose him but congratulate him on his new connection and wish him every success."

Commodore Cunningham got his first berth on the old Sound steamer SHINNECOCK and has been at sea about 30 years. In 1909 he shipped on the Morgan liner MOMUS, and during the World war when the MOMUS was taken over as a transport, he took the first detachment of troops to France. Later he commanded the MOUNT VERNON, and other vessels. His home is in Glen Ridge, N. J.



H. A. Cunningham

## Captain Warner Retires From White Star Fleet

WHEN the White Star liner OLYMPIC sailed from New York on Dec. 5 for Southampton, Capt. George E. Warner, master of the ship, started his last voyage, in command. He retired at the end of the voyage, having reached 60, the company's retirement age, this year. The OLYMPIC's pop-



G. E. Warner

ular commander started his sea career in 1886 as a 16-year old apprentice in the sailing ship PERICLES. Shifting to steam, he served in various ships of the Glen line and was chief officer of the GLENGYLE when she was taken for transport service in the Boer war. His first command was the 5000-ton steamship MONMOUTHSHIRE, in 1904 where he remained until 1913.

During the World war, he was assigned to the armed merchant cruiser OCEANIC, being aboard when she was wrecked in 1914. He served in various capacities and finally as commodore of convoys in the North Atlantic.

Returning to the merchant service, he commanded various vessels including the ORCA, BALTIC, HOMERIC and OLYMPIC.

John R. Geary, after 41 years of service with General Electric interests, including the past 27 years as representative of the company in Japan, has retired from active duty. He expects to remain in Japan for some time, and will continue to serve as a director of the Tokyo Electric Co. Ltd., and the Shibaura Engineering Works Ltd.

James B. Herreshoff, inventor and member of the famous Herreshoff family of designers and builders of America's cup defender yachts, died at his home in Riverdale, Bronx, New York, on Dec. 5. He was 96 years old.

## Buffalo Shipbuilder Dies

Benjamin L. Cowles of Buffalo, 67, died of heart disease while asleep in the McAlpin hotel, New York, on Nov. 26. His lifeless body was found by Chairman T. V. O'Connor of the shipping board, his lifelong friend, who had an appointment with him. Mr. Cowles was well known as a builder of dry docks and tugboats and was the son of Theodore Cowles, well known shipbuilder. At the time of his death he was president of the Cowles Lenahan Drydock Co. and the Cowles Towing Co. and also had a sand and gravel business. During the World war he was engaged in the work of cutting shipping board vessels in two for passage through the St. Lawrence. The steamer NORTHLAND was one of the Great Lakes vessels which he cut in two at Buffalo, took through the canal and reassembled at Quebec for convoy service.

Capt. George Seeth, who for nearly 38 years piloted big ships in and out in New York harbor, died Nov. 29 at his home in Queens, N. Y., after a long illness. He was 80 years old.

Rear Admiral N. E. Niles, retired, died at Woodberry Forest, Va., on Nov. 28. He was 82 years old. During the World war he was on special duty in London.

## New Commander Appointed to Steamer Leviathan

ON Dec. 17 Capt. A. B. "Rescue" Randall was appointed master of the steamer LEVIATHAN, flagship of the United States lines, and was made commodore of the fleet. At the same time Capt. George Fried of the steamer AMERICA was promoted to command of the steamer GEORGE WASHINGTON. These promotions were



A. B. Randall

due to the resignation of Commodore Harold A. Cunningham, and are the reward for conscientious and meritorious service. Captain Randall, who is 51 years old, has spent 32 years at sea, 22 of which he served as master of steamships. From 1907 to 1916 he was captain of naval auxiliaries and during the World war acted as commodore of convoys. In 1921 he resigned to join the merchant service. His first assignment was the steamer AMERICA, later the REPUBLIC, and in 1928 he was appointed master of the GEORGE WASHINGTON.

One of Capt. Randall's outstanding achievements was the transfer at sea during a gale in 1920, of 274 passengers to his ship. For this feat he was recommended for the distinguished service medal. He also figured in several other rescues at sea.

Captain George Fried, who is 52, has been 31 years at sea. He was born in Worcester, Mass., and was educated in the grammar schools of that city. He has served in the United States army and navy.

His first captaincy of a passenger liner was his appointment to the PRESIDENT ROOSEVELT in 1922. While in command of this vessel in 1925 he supervised the rescue of the crew of 25 men of the British freighter ANTINOE, standing by the disabled ship for four days. This spectacular rescue brought



George Fried

him world-wide fame. He was assigned to the AMERICA in 1928 and in 1929 rescued 32 men from the Italian freighter FLORIDA. He has received numerous medals and other awards for his fine record at sea.



# Training Merchant Marine Officers

## Must Be Part of Program If We Are to Re-establish Our Position on the Seas

By C. A. Griffiths

**F**AR flung among the hidden corners of the world the industrious tramp conducts our nation's trade. The stately procession of crack express liners across well traveled lanes carries our world tourists. And, within the boundaries of the country, the Great Lakes steamers and river boats further growing interests and industries. Beyond limitless horizons our daring forefathers set out afloat to conquer unknown lands; battled for them, and maintained their independence against experienced sea fighters. They fostered the development of our western shores by fast clipper ships, and established trade routes for our export commerce. Our heritage, no less, is the sea!

This great manufacturing nation, the growth of internal development maturing, required raw materials from abroad; demanded new markets

The author is a lieutenant in the United States navy and served as a cadet on the schoolship Newport before entering the Naval Academy.

there. With the World war came the realization that our merchant fleet had all but vanished from the seas. Our goods were shipped in foreign bottoms; our money flowed to foreign commerce.

### Building Vessels in a Hurry

We built a mighty war-time cargo fleet, but in the economic depression immediately following the war, no cargoes for them could be found. Ships were laid up; crews paid off. Ten years later, foreign outlets for unconsumed domestic products revived the country's interest in our merchant ships and now is bringing a once bleak future into a pleasanter prospect.

Necessity forced foreign markets for disposing of our excess products, from wheat to steel, produced, not only in the coastal states, but far into the interior as well. Commercial rivalry introduced the element of time into our merchant shipping. No longer is the laborious transoceanic trip by sailing ship an economic pos-

sibility. Speed in transit is the dominating factor, and with the demand for increased speed, more complicated machinery, larger ships, greater power, is required. The shipping industry has developed into a scientific field of operation, management and maintenance. Time is important. Profits are demanded. Delays in loading and unloading, machinery breakdowns, and overhaul periods are expensive. The inaction of a ship is a direct loss to its owners; a steamship is only earning money when on a voyage fully laden.

Down the lane of history, seamen of our merchant vessels paved the way for the nation's present prosperity. Records made and broken, design, development of ship and country, resulted from their efforts. Each seafaring man in his own peculiar way has added to the dignity of navigation, the art of seamanship, or the science of engineering. Recruited from the youth of the country, with the lure of the sea in their blood, our seamen of the past have added to the



*U.S.S. Newport, New York State Nautical academy. Loaned by the navy department*

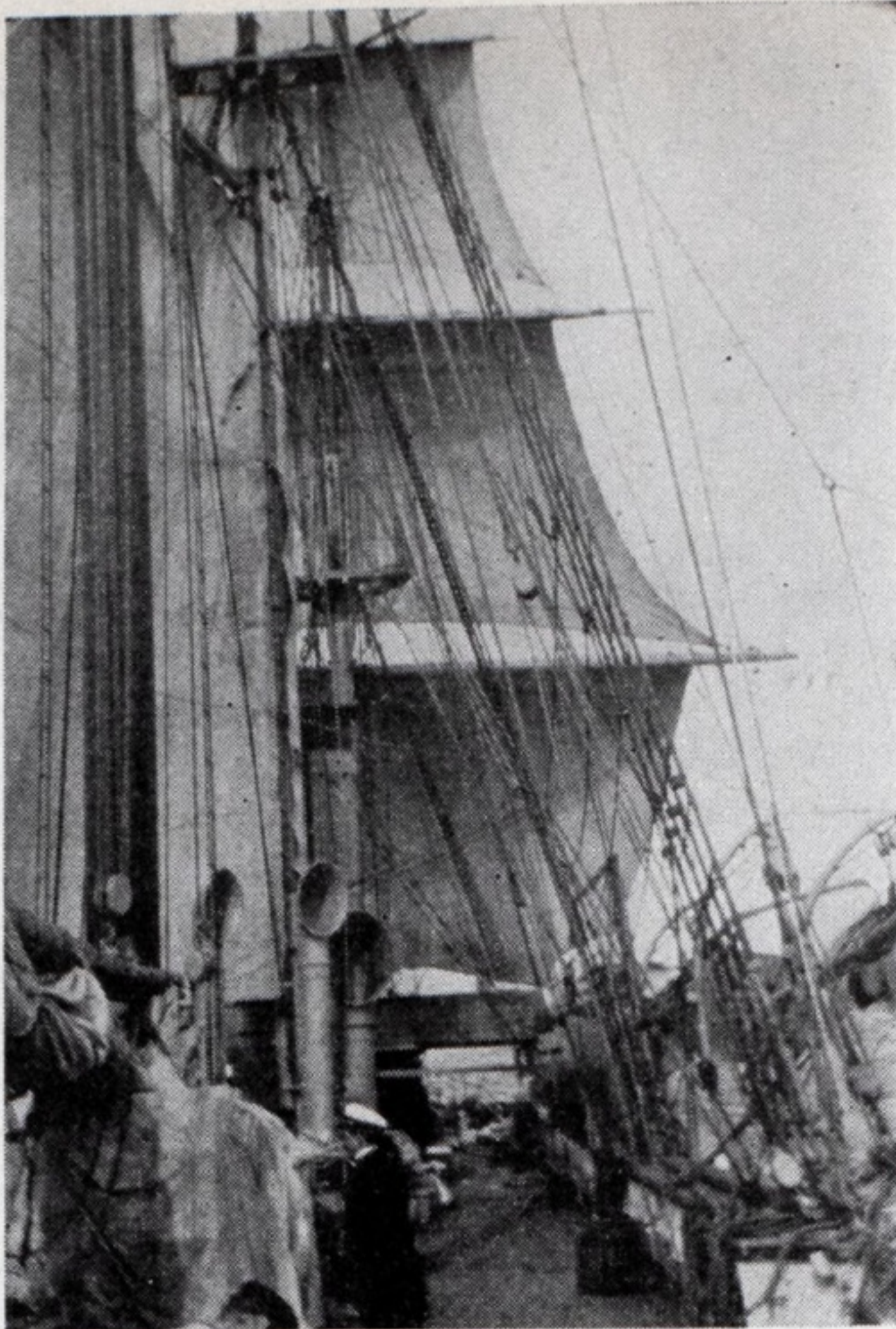


might of the nation. American youth of ambitious character, ideals intensified by fascinating work, passed along to his successors the importance of our country, emphasized in foreign ports. Traditions of the sea, the hidden mystery of foreign ports, combined to form the lure which pulled at young imaginations and drew them from the comforts of a life ashore to that more rigorous life afloat.

The ascendancy of steam over sail not only failed to destroy this fascination, but by increasing the scope of traveled parts has accentuated it. Ports hitherto rarely visited, now, in the mad rush for foreign markets, are frequently reached. The departure of a ship, to the watching boy on the dock, brings forth visions of picturesque, indefinite, ports afar, and he is consumed with a longing to go there, to be on that ship. To the boy brought up in inland communities, the longing to see strange peoples, to hear different tongues, is just as strong. For the good of the future of our shipping, the development of the country, and for the greatest benefit to the boy himself, the most important consideration is: How shall he gratify that longing?

#### Days of Dog Navigation

In the days of the sail the boy's impulse could be satisfied only by suffering the hard knocks, the rough life, of shipping before the mast, or by signing on as cabin boy. The prospective mariner of eighteen then learned his navigation only through the kindness of some skipper, his seamanship from the end of a belaying pin, his sailing from the bellow of the "bucko" mate. The development of steam introduced new factors into the life of the seaman, yet, without detracting from the previous requirements of his calling. Not only must he know seamanship and navigation, but he must learn the problems of single, twin, and quadruple screw ship handling as well. The intricacies of engineering opened up a new field, that of the marine engineer. In



*Under sail. Starboard side main deck. Looking forward*

the early days of steam opportunities for gaining knowledge in that line of endeavor were most limited. Engineering was learned only from the practical end of a shovel, and the repair of frequently broken down machinery was the instructor.

The days of "dog navigation," where the captain knew his ship's position along the coast by the bark of the dogs on the beach are gone. Science, coming to the aid of the navigator, has introduced new, complicated, apparatus, radio beacons, time signals, electric helmsmen, radio compass stations, the sonic depth finder, and many other improvements, all having for their aim, greater accuracy, greater rapidity, and greater safety for the vessel.

Scientifically trained officers, men capable of understanding the intricacies of the modern bridge, are in demand. The average green hand, even if he is exceptionally intelligent or industrious, has a long, hard, uphill, struggle to overcome the handicap

that education imposes. Changed conditions in the present stages of advancement in the maritime world has precluded the methods of learning which past generations of officers had available. Even though the average span of life has increased, the greater quantity of knowledge to be absorbed cuts down the time to do it in. Competition is keener, and the complexity of machinery aboard the modern merchantman requires well educated men on the bridge.

#### Apparent Simplicity of Fuel Oil

The engine room in a modern, high speed, turbine driven ship having small tube, high pressure, superheated steam boilers, presents an unknown maze of intricate machinery in which the old-time chief engineer would be lost. The multitude of constantly changing improvements to gain an increase in efficiency, and thereby lower the operating costs, requires continual study by the chief engineer of the present merchantman to keep abreast of the times. It is a far cry from shoveling "black diamonds" into the hungry, double-ended, fire tube boiler to the apparent simplicity of fuel oil. Under the old regime the only school for youngsters was the school of the "black gang," on the wrong end of a slice bar. The road to learning was a lengthy one from fireman, to oiler, and finally, years later, with only such intermittent study as was possible when off watch, the coveted "ticket" was theirs. Today there is not time to serve this long apprenticeship.

The need for a school for maritime education was recognized as far back as 1874, when the federal government loaned the United States sloop-of-war St. MARY's to the state of New York for that purpose and appropriated \$25,000 annually to assist in its expenses. This ship was condemned in 1907 and was replaced by the U. S. S. NEWPORT, a thousand-ton gunboat, barkentine rigged, but having the additional advantage of steam which the St. MARY's lacked. This vessel became the schoolship NEWPORT and ever since then has been graduating approximately twenty-five boys each year to serve later as officers in our merchant marine. To the states of Pennsylvania and Massachusetts two other naval vessels were loaned by the government and a similar amount appropriated annually to assist in their support. And, finally, during the last session of congress provision was made for a fourth schoolship to be located in California.

The course on the NEWPORT is of two years' duration, years well spent in obtaining a practical education in navigation, seamanship, and engineering. The evils of long apprenticeships in these days where time is all important are overcome. The search for a nautical education, always a more difficult course to fol-



*A class of cadets under instruction on deck. This assembly is often an informal occasion. On board New York Schoolship Newport*



low than the counterpart ashore, is supplied by competent instructors who have no other interferring duties, no cargoes to worry about, no troubles over the length of the trip, nor of profits demanded at the end of a voyage. Under these capable instructors the cadets of the schoolships are thoroughly grounded in the technical requirements of their trade, and, when leaving, they go with sound fundamental knowledge on which to build their future.

#### Admission to Schoolship Newport

Cadets are admitted to the NEWPORT between the ages of seventeen and twenty. The only outlay of money required is a nominal sum at entrance to cover the cost of the initial outfit of clothing which is compact and shipshape and patterned after a man-of-warsman's outfit. A small amount of spending money is also necessary, but an upper limit is established which, for obvious democratic reasons, should not be exceeded. Other than the replacement of worn clothing from time to time there is no additional expense. All books, food, bedding, and other living necessities are furnished by the school.

There are mental requirements which any boy with a good grammar school education can pass. The applicant must be of good character, resolute in spirit, and master of himself. He must be physically active and able to withstand the hardships that go with a life at sea. But, the most important requirement is that he possess an aptitude for the sea. The boy who "bends his whole weight to the oar" is the type of boy who is wanted. The wastrel, the boy who is afraid of manual labor, is not wanted, nor will he be tolerated. After having once passed the entrance requirements, these boys of average intelligence, sound in wind and limb, and brought up in accordance with the ten commandments, are first taught to look after their physical person and learn that "cleanliness is next to godliness" is true. They are thrown into contact with boys their own ages and those of the upper class who have completed their first year. They are assigned to "messes," each of about ten cadets, mixed in the ratio of about one third of the second year men to the remainder of the new arrivals. They are led and instructed by the officers of the ship and are taught the rudiments of discipline and recognition of constituted authority. They learn the value of precision and punctuality in all their actions.

Each year of the course is divided into two terms: the winter, devoted to studies while the ship is moored to a dock; and the summer of practical instruction during the three months' cruise. The winter term begins about November first. The first winter the studies parallel those of the usual high school, a continuation

of the grammar school course. Saturday afternoons and Sundays, provided their conduct has been satisfactory, the cadets may go on liberty. Week days they are not allowed ashore.

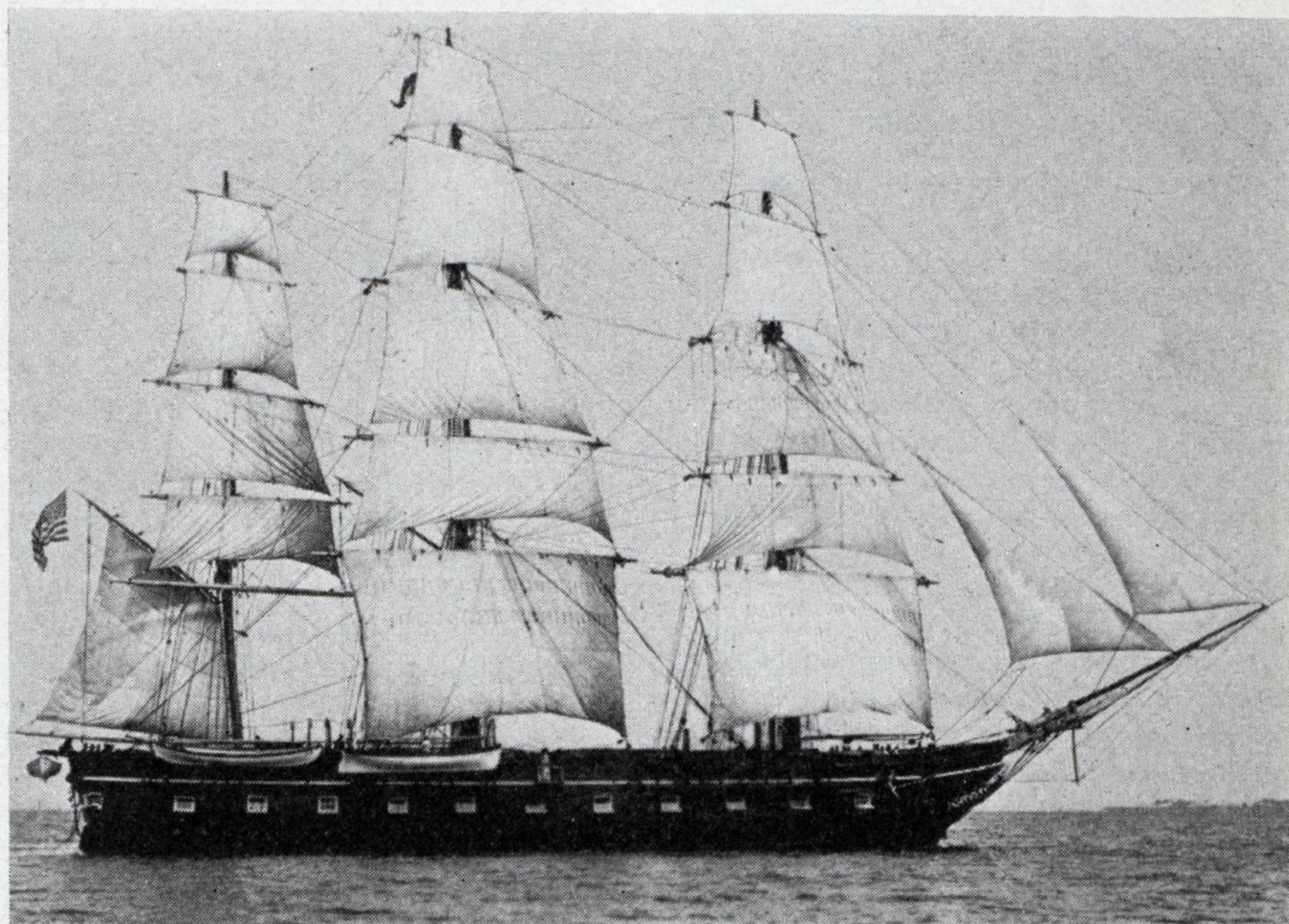
Practical work during the winter is given as far as is practicable in seamanship, knotting and splicing, rules of the road, engineering and electricity, which forms the foundation for the following summer's practical experience.

Upon the completion of the first year, during which all cadets follow the same course of study, the cadet is allowed to select for himself whether he wishes to become a deck officer or an engineer. The course during the second winter is, therefore, divided into two branches, deck and engineering, and the studies of

stands a trick at the wheel, and learns, while steering close to the wind, to give her spoke by spoke until the wind, fluttering the weather leech of the foresail, suddenly fills. The thrill of holding the ship close to the wind, to catch every breath, is his. He learns the "feel" of each piece of running gear, so that on a dark night, cloudy, overcast, in a spanking breeze, when he is sent aloft to furl the mizzen topsail, his hands will not by mistake grasp some loose halliard for support.

#### Knowledge Increases Rapidly

On the long tacks into the northeast trades on the twenty-one day run to Plymouth, England, his knowledge of seamanship, and the laws of storms, and cloud formations, and what they mean, grows rapidly. He



*U.S.S. St. Mary's New York Nautical schoolship from 1874 to 1907*

the winter and the practical work of the following summer cover the ground for the particular branch selected.

#### Summer Cruises Most Useful

The winter term ends about the first of May and the cadets go home on leave for about a month. During this time the ship prepares for the summer cruise. Temporary deck houses, built for the protection of the cadets during the cold winter months, are removed. Canvas is bent on the spars, running and standing rigging is overhauled, the ship is dry-docked, and a full load of stores, supplies, and provisions are taken aboard. Then about the first of June, the cadets report on board and the ship leaves for the summer cruise.

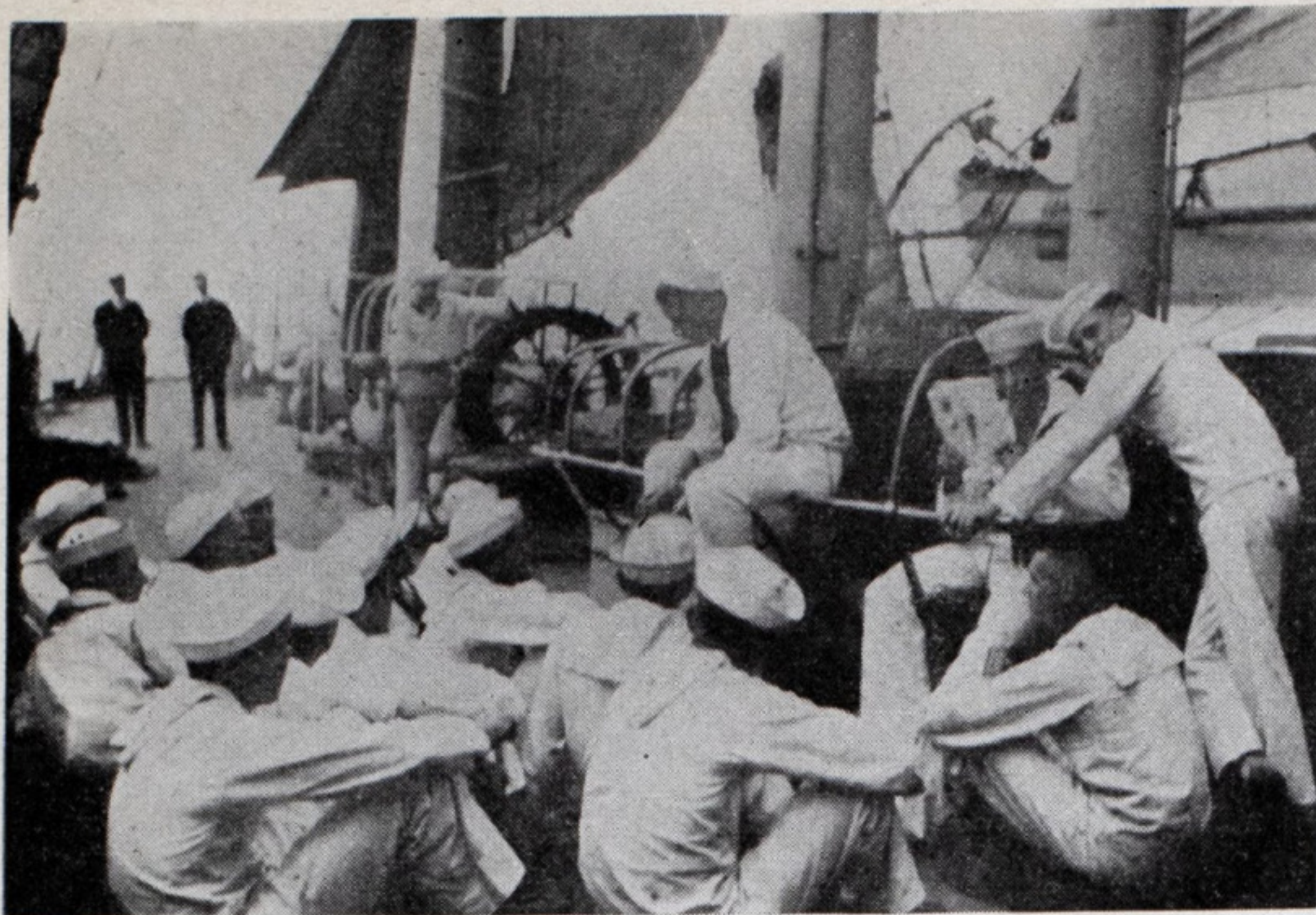
This, to the cadet, is the best part of his two years. Here he gets his first taste of the sea. He puts into practical application those things he studied about during the winter. He

becomes more and more proficient in his daily navigational sights until he has sufficient confidence in himself to know that they will not put him in the middle of North Dakota when he is assured by dead reckoning of his approximate position in the Atlantic.

The engineer cadet during the cruise learns, not only how to shovel coal and wield a slice bar, but the object and use of the many gages, valves, thermometers, and instruments in the fire rooms as well. After he becomes proficient in the all important duties of maintaining a steady fire and steady water level in the boiler he is sent into the engine rooms and begins a study of the machinery there, first as an oiler, later as a throttleman.

He studies blueprints, materials and processes of construction, and actively assists in routine repairs. He stands watches in the dynamo room and learns the theory and practice of electricity, and the distribution of





Watch on deck  
on the U.S.S.  
Newport New  
York State Nau-  
tical academy.  
Ship under way  
under sail with  
cadets at the  
wheel

electricity throughout the ship. By the end of the second summer cruise the engineer cadet's instruction has been completed and he is in a position to take his examinations for third assistant engineer and pass with flying colors as soon as he completes the required third year.

These summer cruises are of interest, not only for their practical and educational value, but for the knowledge gained that travel brings besides. The NEWPORT usually visits European ports, among which during the recent summer cruises were, Plymouth, Cherbourg, Las Palmas, and Hamilton, Bermuda. On a cruise of seventy-seven days, for example, thirty-six were spent in port. Opportunity was afforded to visit foreign shores, to see many places, strange to them at first, where the cadets met people of other countries and learned something of their ways.

### Keeping in Good Condition

The cadets physical well being is never neglected. During periods in port they are taught how to swim and row, and are given plenty of practice in handling small boats under oars, sail, and steam. Daily setting up exercises, ending with a climb over the cross trees are a definite part of the curriculum during both winter and summer. Athletic contests are encouraged and a yearly track meet under the amateur athletic rules is held in the spring.

In the summer, pulling and sailing races are frequent, and when two schoolships from different states happen to be in port at the same time, rivalry in a ten-oared cutter race runs high. The importance of body building as a means of developing better men is thoroughly recognized. Sports are constantly supervised by officers. The continual effort is made to teach every boy not only how to win, but how to lose like a gentleman as well.

The course of study for the second year covers subjects almost exclusively maritime and it is during this year that the development of the cadet's character is most noticeable. He learns

how to give orders as well as how to carry out those which have been given to him and he develops ability to take increased responsibilities. He is given minor responsibilities and small commands, in charge of a "mess" or coxswain of a boat.

At the end of his two years the cadet is rewarded with a certificate of graduation which entitles him to two years' credit on the three years that are necessary before he is eligible to take the examination for a mate's or an assistant's license. This leaves him but one year to do before presenting himself before the steamboat inspection examiners. And, when he does go before them to take his examination, he has learned to be neat in appearance and person. He has self-reliance and a feeling of mastery over the elements and men. He knows how to take orders from proper authority and he is not afraid to incur reasonable responsibility in carrying them out.

Whether or not the cadet follows the sea for a livelihood, his two years on the schoolship has taught him many useful things that will be of inestimable value to him later regardless of his chosen profession. He has been thrown into personal contact with self respecting, self reliant, forceful instructors, men who have learned how to handle and direct their fellowmen, and who have developed initiative and the power to accept responsibility. From his constant daily association with men of this caliber it has been impossible for the cadet not to absorb a great deal of these characteristics. He leaves the schoolship with knowledge of how to use intelligent initiative and take responsibility. These are the very qualities that reward by greater return in dollars and cents to the state and country.

Built by the American Ship Building Co., Lorain, O., in 1920, the S. S. HENRY COUNTY is a cargo vessel of about 4150 tons. The outline of the ship is of the conventional raised poop, bridge, and forecastle design. Of 251 feet in length, 44 feet in breadth, and drawing 26 feet when fully loaded, the vessel appears both

seaworthy and comfortable. Two oil-fired scotch boilers supply steam at 180 pounds pressure to a triple expansion engine of about 1400 shaft horsepower, which drives the ship with a single screw at  $9\frac{1}{2}$  knots. Fuel oil for a cruise of 7500 to 8000 miles can be carried without the necessity for refueling.

Originally built to carry 35 officers and men in the crew, the two capacious holds are being converted into double compartments that will accommodate 120 additional cadets. It is planned to divide these two holds into class rooms and living quarters built on a 'tween deck which was not originally installed. The ship is now undergoing overhaul at the navy yard, Norfolk, Virginia, preparatory to her trip to California. A skeleton crew of naval personnel has been detailed to take her out.

The recent increases in American shipping have created a demand for Young Americans who possess the requisite general and technical knowledge for responsible positions in our merchant marine. These schools of nautical education are the sources from which we must recruit our merchant marine officer to uphold the prestige of our flag on the high seas and to restore our commercial fleet to the high plane it held so long in the days of canvas.

Graduates from the present schoolships have scattered to the four corners of the world and have invaded every profession. There are many of them in the navy, many have returned to a life ashore, better for their experience at sea, while a good percentage of those who obtained their initial love for the sea on a schoolship are today commanding important positions in the merchant marine.



Schoolship Newport under sail



# Fuel Consumption of Steam Vessels

Balanced Design for Best Results—Overall Efficiency Real Test—Care in Operation an Important Factor—Rapid Improvement in Recent Years

By Frank V. Smith

**F**UEL consumption is an index of overall engineering efficiency. It is the resultant of a combination of elements which go to make up a complete power plant. Having a composite background fuel consumption then is not indicative in detail of the merits or demerits of individual items which make up the whole.

Marine steam power plants can be designed to obtain fuel rates as low as 0.55 pounds of oil per shaft horsepower hour for all purposes by proper engineering co-ordination. How far it actually pays to design a ship's power plant for low unit fuel consumption evolves upon a study of the laws of diminishing returns. The deciding factor is one of economics; in other words, one of evaluating fuel savings against increased capital charges.

The point of maximum returns differs on various types and classes of vessels. In ships of small power rating many economic measures are not applicable because the unit cost of the equipments do not drop proportionately with the power. Economic evaluations must also take into account the trade route of the vessel, percentage of time underway and in port, and fuel prices at ports of call. Low fuel consumption then should be considered as an engineering achievement, rather than as an economic achievement. The shipowner is interested in maximum returns, which means striking a proper balance of values.

## Steam Engineering Takes Stock

When steam machinery first began its defense against the inroads of the diesel engine it had to begin by making a thorough study of itself. Sleepless nights were spent over "Mollier diagrams" and "heat balance calculations." The Rankine and Carnot cycles began to take on concrete meanings. Investigations were made of auxiliary arrangements and feed water heating systems. Elimination of heat losses and the conservation of low head heat became the slogans of the application engineering departments. Out of all this was evolved a new technique and a better understanding of fundamentals.

When some of the established engineering methods came under the eye of the analyst many of the find-

ings were startling. Excess auxiliary exhaust steam was being piped directly to the main condensers and extra power was being applied to the circulating pumps to get rid of the excess heat—amounting to some 952 B.t.u.'s per pound of steam. Boiler efficiencies were but from 70 per cent to 75 per cent efficient because of lack of knowledge regarding the theories of combustion. Steam auxiliaries were found to consume from 30 to 50 per cent of the total steam generated. Available energy and throttling losses were found to be excessive.

The first studies were made to eliminate waste by means of properly co-ordinating the engineering apparatus aboard the ship. These first studies showed that in many cases savings in fuel of from 5 per cent to 15 per cent could readily be attained with little or no additional capital expenditure. In other words, ships that were burning from 1.1 to 1.2 pound of fuel oil per shaft horsepower hour were thrown together rather than designed. There are a lot of ships today in this class that need a doctor. They need a little superheat here and a little feed heater there.

The second phase of the economy engineering program was to devise means of attaining still higher overall efficiencies. Several avenues presented themselves, as shown by the following groups:

Group I: Raising the greatest possible amount of steam for the amount of fuel burned. (a) Through better boiler design. (b) Through better combustion efficiency.

Group II: Getting the greatest amount of useful energy out of the steam so raised. (a) Through increased prime mover efficiency. (b) Through more efficient means of power generation for auxiliary purposes. (c) Through more efficient auxiliaries. (d) By reduction of throttling and available energy losses to a minimum.

Group III: Heat conservation. (a) through improved methods of heating the feed water. (b) Through salvage of part of the heat in the stack gases.

Material progress has been made in group 1. Modern boilers are now designed (without air preheaters or economizers) to give efficiencies of from 81.5 per cent to 82.5 per cent, or a gain of from 7.5 per cent to 11.5 per cent over the average values which were normally being attained but a decade ago. Part of this gain has been due to modifications in the

boiler design itself, and part to a better combustion efficiency. In the latter, proper atomization of the fuel oil and proper air regulation have played a prominent part. Boilers, fuel oil burning apparatus, and air regulation arrangements, which give less than 81.5 per cent efficiency, are now out of date and belong to a past era of engineering.

Permanent progress has been made under group II.

The mechanical efficiencies of turbines have been increased. Ten years ago marine turbine efficiencies ranged from 65 per cent to 75 per cent whereas today they are normally designed for efficiencies ranging from 75 per cent to 80 per cent, depending upon the power rating and steam conditions.

The more economical use of steam has also been accomplished through an increase in the initial pressure and temperature and the improvement in vacuum apparatus. The combined gains due to both the increased turbine efficiencies and the improved steam conditions amount from 10 per cent to 20 per cent over what was considered normal but ten years ago.

## Looking Into the Auxiliaries

The auxiliaries which heretofore were practically all steam driven were responsible for very large losses, not only because they were large steam consumers themselves, but also because they were responsible for what is known as pyramidal losses. On turbine ships it was practically impossible to secure a proper heat balance with an all-steam auxiliary layout because the limit of auxiliary exhaust that could be utilized in the feed water heaters was but 12½ per cent of the total steam raised. Increasing turbine efficiencies and adopting steam conditions which would further reduce the quantity of steam used by the main power plant, further aggravated the problem. Auxiliary electrification became the answer to this vexing problem.

The method of generating electric power for the auxiliaries then became a subject for analysis. The possible solutions in the case were as follows:

- (a) Use of condensing turbine-driven generators.
- (b) Use of diesel engine-driven generators.
- (c) On electrically driven ships:
  1. Power from the main propelling units by the transformer method.
  2. Power from the main pro-

The author, Frank V. Smith, is a member of the staff of the Federal and Marine Department of the General Electric Co. This article was prepared at the request of the editor.



PELLING units by means of a motor generator set.

3. Power from an auxiliary generator attached to an extension of the main generator shaft.

(d) On turbine gear driven ships: Attachment of a generator to an extension of a pinion shaft.

An exhaustive analysis of the subject brought out many sidelights.

On high powered ships in which the total auxiliary needs were considerable, the use of condensing turbine driven auxiliary generators completely justified itself. Auxiliary turbine generators of 500 kilowatts rating and above had very good economy. It being not entirely possible to take power from the main unit under all conditions of operation, or to operate all of the auxiliaries by means of constant speed alternating current motors, it would be necessary to provide standby steam sets for port and maneuvering conditions. When equating such items as low water rate of the main unit and the losses in the motor generator set on the one hand, as against the direct methods, it showed that the savings would be but 1.8 to 2.0 per cent. The small saving hardly justified the loss in flexibility of power arrangement.

The small powered ships requiring but a small amount of auxiliary power were found to be the most troublesome because small turbine driven generators (100 to 150 kilowatts) were not basically highly efficient machines. The economic differences between the turbine generator method and motor generator method were found to justify the latter on ships of small power.

The attachment of an auxiliary generator to a pinion of the gears on a turbine gear ship is an economical method of securing cheap auxiliary power. Like other direct systems, however, standby sets for maneuvering and port conditions must be installed.

#### Inability to Use Available Heat

The throttling or available energy losses were found to be excessive in the older type of marine installations. In ships having steam auxiliaries of the reciprocating type, it was usual practice to reduce the steam pressure on the auxiliary line to 100 or 125 pounds pressure by means of a reducing valve. The inability of the steam auxiliaries to utilize the steam through its possible full expansion range was, of course, wasteful of energy, as it simply transferred a portion of the heat energy of the steam from the available class into the unavailable. This, in turn, made it necessary to generate more steam for the same amount of work. As the initial steam pressures were raised to favor the main turbines, the position of the reciprocating steam pumps became more untenable.

Heat conservation (group III) has taken on a new meaning.

In connection with the boiler plant it brings forth air preheaters and economizers, and in connection with the steam plant, extraction methods of series feed water heating.

The gain in efficiency of the boiler plant through the adoption of either economizers or air preheaters is a matter of design and the amount of waste heat salvage from the stack gases. Normally they are designed to attain an overall boiler efficiency of from 85 per cent to 87 per cent, although a few scattering installations claim a few points better.

#### Feed Water Heating Improved

The extraction system of series feed water heating, which is now coming into general practice in all new power plants, results in actual savings in several directions:

1. It elevates the temperature of the feed water, thereby increasing the evaporation per pound of fuel.

2. It results in slightly higher turbine efficiency.

3. It reduces the amount of steam entering the condenser, thereby reducing the amount of latent heat lost overboard in the circulating water.

4. It reduces the duty on both the circulating and condensate pumps.

The benefits to be gained depend upon the extent to which the system is applied. The addition of a high pressure heater, which elevates the temperature of the feed from the usual 230 degrees to 300 degrees Fahr., results in a fuel saving of approximately 2.8 per cent.

When a plant layout has been completed and the path of each B.t.u. is traced, the question may be asked, "How close to the calculated values will the plant actually operate under service conditions?" This can be answered by asking another—"What values were used for the variables?"

1. Heat value of fuel oil.
2. Temperature of sea water and vacuum obtainable.
3. Load factor.
4. Operating success of crew.

The heat value of the fuel oil may range anywhere from 18,000 to 19,500 B.t.u. per pound. Probably a good average value for bunker oil is 18,500 B.t.u. per pound. Why place your faith in a higher value when the average is what you are after? Fuel values that are corrected to some high value look good on paper but that does not help the fellow who buys the oil.

An excellent vacuum with 70 degrees Fahr. sea water is 28.5 inches and with 80 degrees Fahr. sea water, 28.0 inches. This means the use of a liberally designed condenser free from air leaks and an efficient air removal system. If the condensing equipment cannot maintain the foregoing results, then the design is not up to present day standards of engineering efficiency or the crew needs a little extra training in the tracing of air leaks.

The power plant can be designed

to give its highest efficiency at any load factor designated within its designed limits of power. When it deviates from that particular minimum point the fuel rates per unit of power show a slight increase.

The operating personnel can either make or break the guaranteed or expected values of the application engineer. It depends upon their knowledge, their inclination, and their ambition. Improper atomization of the fuel oil, improper air regulation to the furnaces, dirty tubes, air leaks in condensers, faulty operation of the hand valves on the turbine, waste of auxiliary power, and steam leakage can all greatly affect the values.

When choosing working values for the variable factors they should not be placed too high because it is an injustice to the crew, and they should not be placed too low because the crew are given too much liberty to become careless.

It has been the experience of the author that when care is exercised in the computation of the heat analysis, and where normally obtainable operating values have been used as the basis of the calculations, the operating records have invariably met the mark. In several instances they have been better by from 1 per cent to 2 per cent. One ship varied by less than 1 per cent over a range of from 10 to 110 per cent of rated power.

#### Some Conclusions and Comments

Enough has been said, it is believed, to show that the advances made in the marine steam engineering field during the past decade have been the result of engineering co-ordination.

The boiler manufacturers are to be commended for the way in which they have mopped up their part of the problem; the manufacturers of fuel oil burning apparatus are to be congratulated for the fine showing they have made. The electrical manufacturers, who are now the largest manufacturers of powering machinery in the world, have done an excellent job in increasing the efficiency of the propelling equipment and have supplied reliable and efficiency auxiliary motor drives, which have resulted in balanced plant engineering. There is a lot of credit coming and the author begs to be excused for any omissions.

From a strictly engineering point of view there is not a country in the world that can produce a more efficient marine power plant than the United States. We have at our disposal every known means for furthering economy. Up to the present time we have not built a ship that includes all the measures at one time, but if occasion demands, and each piece of apparatus can prove its own economic worth, we are ready. Engineering efficiency is only to be commended when it can also wear the title "economy engineering."



# World Exports Show Decrease But Still 16% over 1925

**T**HE condition of our foreign trade is a matter of great concern to the country as a whole and directly, of course, to steamship owners and operators. The National Foreign Trade council has just issued its annual review on the condition of international trade. This review frankly accounts for the down turn in exports all over the world by citing the facts of increased production during the past five years. It also calls attention to the fact that the manufacturing industry of the United States is substantially holding its own in exports, while Europe, our best customer, is just now the steadiest field of international commerce.

The main points of the report are given briefly below:

The steady growth of international commerce has been interrupted this year for the first time since 1921 by a net decrease of about 8 per cent in the volume of the world's export trade. But, in spite of the present down turn, international trade, as expressed in world exports, is still about 16 per cent greater in volume than it was in 1925. About two thirds of this gain in the tonnage of world trade, that had been made since 1925 up to the end of last year, will thus still be retained at the end of 1930, on the basis of present figures covering about half the world's commerce.

World export trade for 1930, according to figures up to Dec. 1, for nations carrying on about half of the world's commerce indicate that the export trade of the 101 nations of the world will be about 22½ billion dollars for 1930. The total exports of these 101 nations for 1929 were \$24,427,000,000, both figures being reduced to the common index of 1913 prices.

A notable fact of the year's business is that European export trade has been less affected by the present depression than that of any other section of the world. The actual volume of Europe's export business has remained very close to what it was in 1929. Though its trade is less than last year's in current dollar values, this is almost entirely due to the fall in prices. In 1929 the aggregate export trade of the 27 European nations had at last reached 99 per cent of its 1913 volume. The figures reported by the various governments place the 1929 total at \$11,985,000,000, adjusted to the 1913 dollar, compared with \$12,086,000,000 actually reported by these nations for 1913.

World prices are lower, meanwhile, than at any time since the war; even lower than in 1921. They have decreased since this time last year by

fully 15 per cent, approximating, as an index of present world export values, a figure of less than \$1.20 as related to current dollar values in 1913. The recession since 1925 has been from a corresponding world export index price of \$1.56, on the 1913 dollar, or a drop of almost 25 per cent in the past five years.

The most constructive factor of the present year is, however, that manufacturing industry, particularly in Europe and the United States, though reflecting the general reductions of prices, has not substantially reduced the volume of its products entering international trade. The single exception is the automotive industry whose exports, almost 90 per cent of which come from the United States, have dropped off during the present year almost by half from its 1929 record. The average diminution of other manufactured exports from the United States by only 8 per cent, coupled with the ability of Europe to maintain her own predominantly manufactured exports at practically last year's volume, show that the greater part of the year's losses in foreign trade has been absorbed by the more speculative international commerce in raw materials. This relatively steady market for the products of manufacturing removes much of the danger from the present situation and presages an improvement for the near future.

## Keel Laid for New Liner

*(Continued from Page 21)*

sion will be by twin screws driven by triple series turbines and single reduction gears, developing 34,500 maximum shaft horsepower giving a sea speed of 20 knots.

The new liners will be of modern design throughout and they will have an appearance of grace and speed. There are to be two low raked elliptical funnels. The bow will be of semibulbous type. The stem will be raked and the stern will be of the merchant counter cruiser type. The length overall is to be 705 feet and the beam 86 feet. First, tourist and third class passengers to a capacity of about 1300 will be provided for; 600 first class, 490 tourist and 230 third class.

Interior of the new ships will be of exceptional quality throughout. There are to be large lounges done in the Georgian, Jacobean or Tudor design equipped with stages and talking motion picture equipment. In all passenger arrangements in pub-

lic and staterooms every need and comfort of the traveler will be considered.

Special study has been given to safety. The regulations adopted at the international safety at sea conference held in London last year will be complied with in full. Every proved practical safety device known to modern science will be used.

In addition to passenger quarters express cargo will be carried. The holds will have a capacity of 350,000 cubic feet. Some of this space will be cooled for the transportation of perishable products. Another 16,000 cubic feet will be refrigerated for storing food stuffs for passengers and crew.

Laying the keel of this magnificent new liner, which is to carry the American flag on the Atlantic, is an important step in the upbuilding of the merchant marine. For this, recent and present governmental policy, is directly responsible.

## Port Traffic Gains

Figures for the first nine months of the year for the Port of Houston, Tex., reveal that despite a nationwide slump in business this port made greater progress this year than last. Statistics covering the nine-month period show that the port made a tonnage gain of 19.7 per cent over the corresponding period for 1929 and a gain of 41.30 per cent over the same period for 1927. Vessel movements were 2927 for the first nine months of the current year. During the past year this port rose to first place in the United States as a cotton exporting port.

To meet demands made by increasing commerce, numerous improvements were made during the past year. These included the enlargement of the Houston grain elevator, giving it a capacity of 3,500,000 bushels, whereas its former capacity was 1,000,000 bushels. Installation of two 25,000 kilowatt generators by the Houston Lighting & Power Co. is practically completed. A 16-acre site on the Houston ship channel has been acquired by the Davidson Chemical Co. of Baltimore for a large fertilizer plant. Dredging for the wharf has been finished and a spur railway track and shell highway have been constructed. About four miles of additional railway storage tracks were constructed and a contract has recently been awarded for the construction of about eight miles more of main line trackage.

Destroyers on the deferred payment plan are offered for sale by the navy, providing they are not to be used for transportation of illicit beverages, and both bond and notes are furnished in payment, the navy department announced Dec. 9.



# Twin Screw Diesels in River Towboat

Each Engine Connected to Propeller in Tunnel of Unusual Design—Excellent Performance on Trials—For Towing Self Unloading Bulk Cement Barges

**T**HE diesel, twin screw, river tug **WILLIAM DICKINSON**, built for the Marquette Cement Mfg. Co., Chicago, by the Marietta Mfg Co., Point Pleasant, W. Va., from designs prepared by T. R. Tarn, naval architect, Pittsburgh, has been delivered to her owner at Cape Girardeau, Mo., after having given a good performance during her acceptance trials at the yard of the builder.

Principal dimensions of the vessel are as follows:

Length on deck, feet .....	124
Beam molded, feet .....	26
Depth molded, feet .....	7
Crown of deck, inches .....	6
Mean draft, in service, feet	5

This vessel was designated for towing bulk cement barges on the Mississippi river and will operate out of the Cape Girardeau plant of her owner to St. Louis and Memphis where extensive river terminals have been built. The construction of the tug includes the most modern equipment available with special provision for the comfort of the operating personnel in good living quarters.

## Some Unusual Characteristics

The steel hull is of the open tunnel type with modified scow bow, square transom stern, round bilges and is framed transversely. The deck is faired forward and aft and terminates in rounded corners at the transoms. At the forward transom, knees are fitted for towing.

The under water portion of the stern is arranged to facilitate the easy entrance of water to the propellers and also for easy discharge in order to obtain maximum effectiveness in propulsion, greater ability to steer and handle, to simplify the hull construction and the attachment of the stern bearings, struts and rudder bearings.

Unlike the usual curved and rounded tunnels, the tunnels in this vessel

are flat topped and straight sided to more definitely direct and deliver a solid column of water to the propellers. The effectiveness of the propellers is improved due to the elimination of the revolving or swirling action imparted to the water in the case of rounded tunnels.

## Complete Auxiliary Equipment

Fuel capacity of forty tons has been provided in the wing tanks abreast the engine space in three fore and aft tanks, port and starboard.

The forepeak provides ample space for the special Marietta built duplex air engines for the deck capstans, air storage tanks for the main and auxiliary diesel engines, the "Lux" fire prevention system, and stowage of deck tackle.

After hull compartments contain the hydro-pneumatic twin steering gears with pumps and tanks associated with the independent steering and handling system. The steering and handling system is similar to the system installed aboard the *NATCHEZ*, *BIRMINGHAM* and *CORDOVA* type tunnel boats operated by the Inland Waterways Corp., and provides for operating the starboard rudders or the port rudders independently of each other to conform to the direction of rotation of each associated propeller.

The main deck house is built of steel and houses the deck room forward, the engine room, and the crew's quarters aft of the engine room. The portion of the deck house containing the crew's quarters is ceiled with Celotex insulation and panelled. The pilot house is built of steel and ceiled with beaded yellow pine finished bright. The usual pilot wheel for the manual operation of the rudders is not included as part of the pilot house equipment. Instead, steering lever controls synchronized with the helm angles are used with a saving of space and less complication.

The exhaust stack is built of steel six feet long by four feet wide and houses the Maxim silencers for the main and auxiliary engines. Sides of the stack are portable for gaining access to the silencers.

Deck equipment consists of two combination manual or power operated capstans on the forecastle, a manual operated capstan on the after deck, and the usual outfit of cast steel bitts, chocks and cavel. In contrast with the usual "low-down," elliptical shaped cavel with its flat top and bottom and small radii of sides which has survived since wooden steamboat days, the barrels of the cavel are of uniform diameter throughout to give less wear with greater contacting surface to the tow lines and with less likelihood of rupturing the rope strands. The chocks are also a departure from the conventional type in that they are entirely pin bearing and each may be used for pulls from either a forward or from an astern direction, thereby eliminating the usual installation of double-chocks to answer the same purpose.

On the after deck, seatings are provided for cranes to serve the trunk hatches over the propellers. A single portable crane is provided to serve these hatches and is stowed below deck when not in use.

All fuel and water hull tanks, deck doublers and fittings, and weather decks are electrically welded in addition to being riveted.

## Diesel Propelling Machinery

The main propelling machinery consists of two, six cylinder, vertical, four cycle, solid injection, directly reversible, full diesel engines manufactured by the Atlas-Imperial Diesel Engine Co.

The engine cylinders are 14 inches in diameter and 18 inches stroke. They develop 350 horsepower each at 225 revolution per minute and are



*Twin screw diesel river towboat William Dickinson built by Marietta Mfg. Co., Point Pleasant, W. Va.*



capable of a greater sustained horsepower should navigational difficulties require.

Each engine is fully equipped with all units necessary for its operation "built-in." The units on each engine are cross-connected with each other and with similar auxiliary units. Mounted on a continuation of the engine bedplates are Kingsbury thrust bearings and sailing clutches. The sailing clutches are operated by means of compressed air jacks from the control station. Each clutch is adjusted to a point just beyond the maximum power requirement and thereby becomes a "slip" or "loose coupling" between the engines and the propellers.

The propelling engines are operated and controlled by means of a new and novel single lever hydro-pneumatic control originated by the engine builder. The control lever has a straight line action and in addition to regulating the engine speeds and reversing, it also actuates the braking mechanism engaging the flywheel.

The propellers are four-bladed, solid wheels, of semi-steel furnished by F. Ferguson & Son. They are six feet in diameter with a pitch of sixty-three inches and turn inboard at the top when operating in an ahead di-

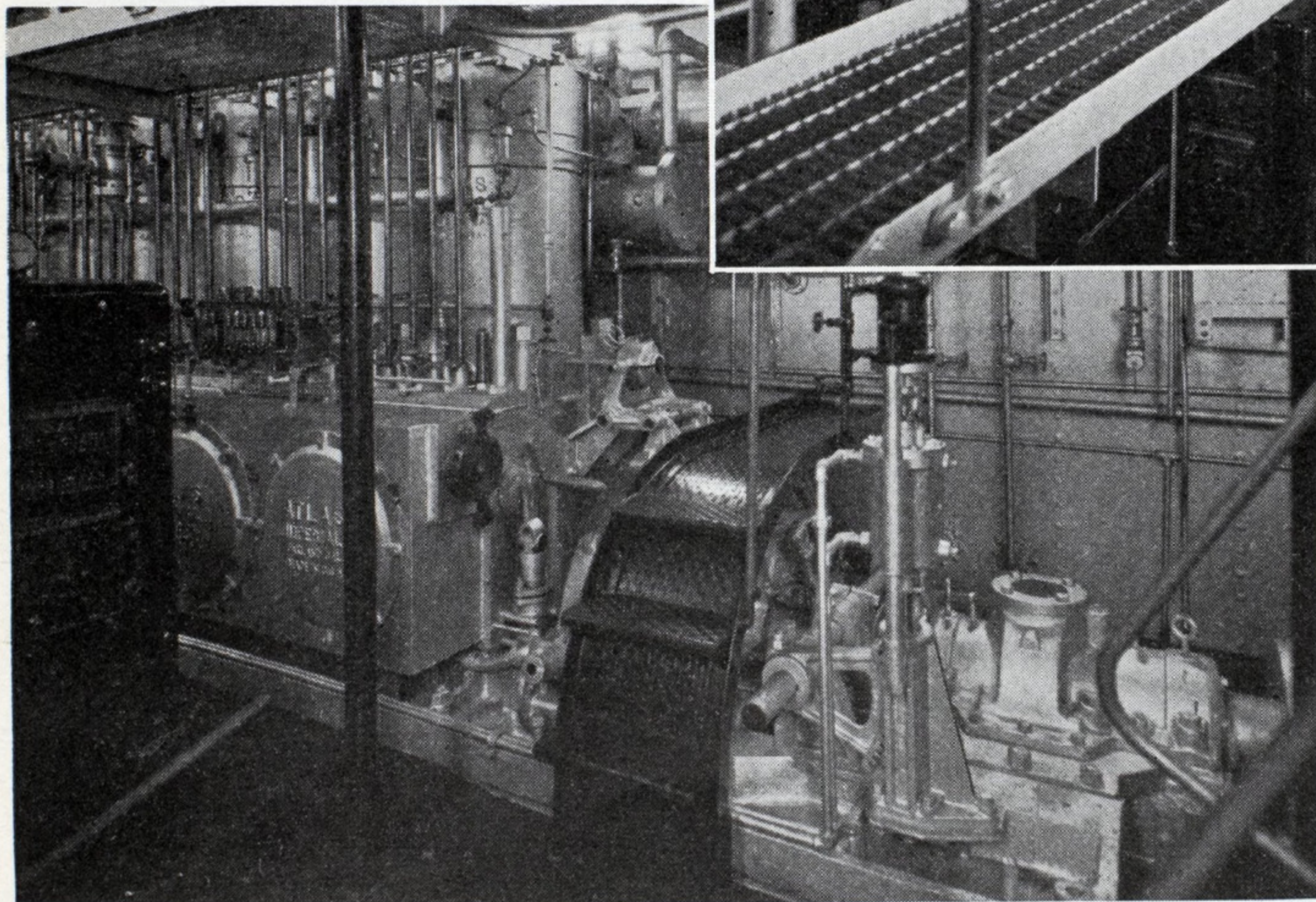
under the flanged heads of the rudders to permit of their sinking out of harm's way in the event of striking obstructions and thereby preclude the possibility of damage to the hull and propellers. Two extra rudders, one steering type and one flanking type, are included as spare gear. For convenience in making replacements of rudders and propellers, the underwater parts have been accurately machined to plug and sleeve gages which were provided as part of the vessel's equipment.

The electrical generating equipment consists of two three cylinder,  $4\frac{1}{2}$  by 6 inch, direct driven,  $12\frac{1}{2}$  kilowatts generator-compressor sets self con-

and pilot house. The vessel thus receives information broadcast from Cincinnati, regarding the river stages and the weather.

The steering gear pressure pumps and fire and bilge pump are of Gould type, triplex plunger pumps, driven through Morse silent chains. The fuel oil transfer and lubricating oil pumps are of Viking type, motor driven, through gears. The fuel and lubricating oil purifiers are DeLaval. The raw water and filtered water service pumps are Crane, motor driven and automatically controlled.

All plumbing fixtures were furnished by the Standard Mfg. Co. Lavatories are provided in each stateroom.



*One of the two Atlas Imperial diesel engines in the William Dickinson*

rection. Two extra propellers one right and one left, are carried as spares.

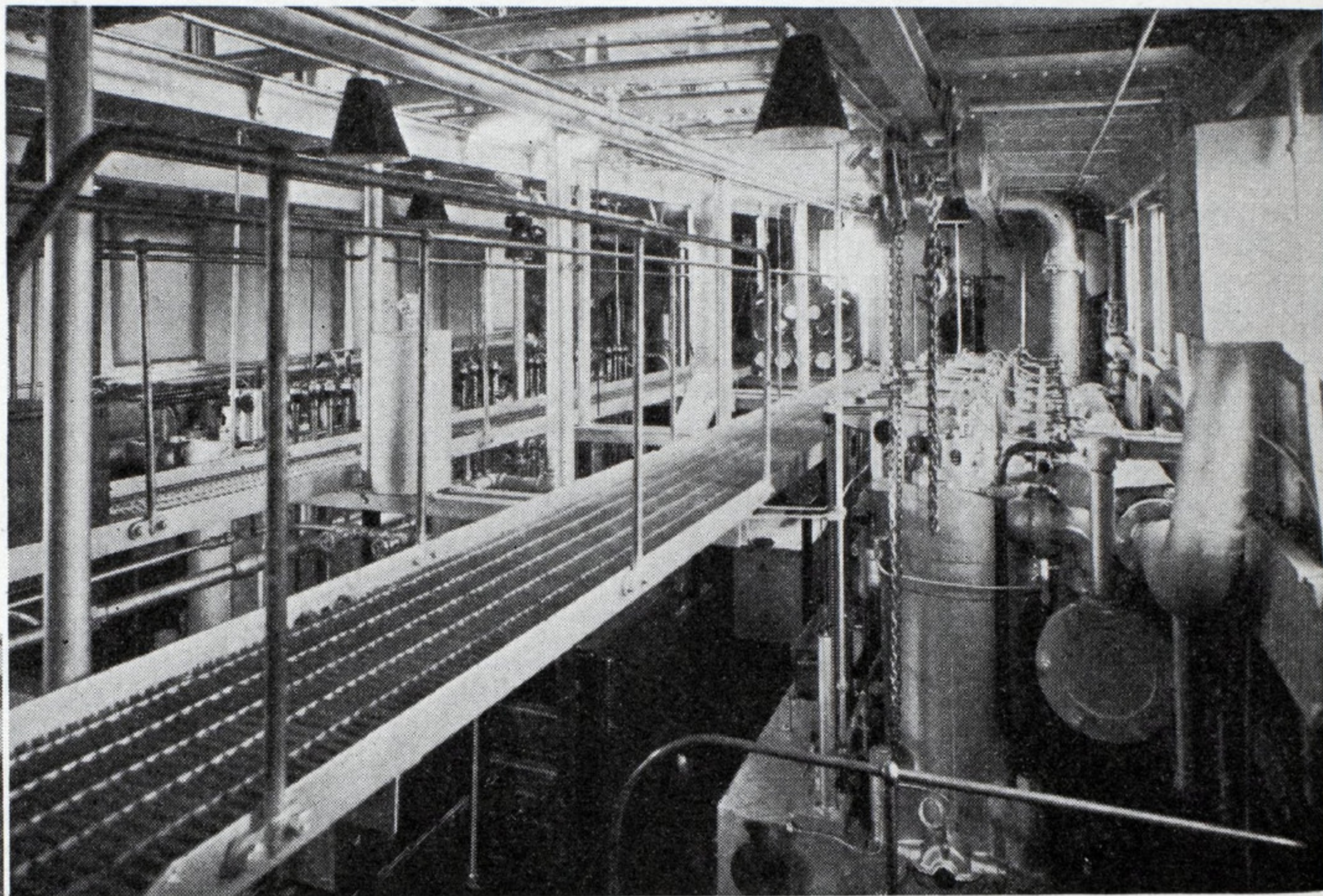
The stern bearing, tube and strut assembly, is extra heavy to withstand hard service. The tubes are flooded with oil from a gravity-pressure system. Tall shafts are  $8\frac{1}{2}$  inches in diameter and the line shafting 8 inches in diameter. The intermediate bearings are of the "SKF" type.

The rudders are made of cast iron. They are secured to the nickel steel rudder stocks by means of flanged heads. Breaking necks are provided

tained on a common bedplate. The air compressors are Ingersoll-Rand, 5 by  $2\frac{1}{4}$  inch by 4 inch in size, driven through friction clutches from the engine generator shafts.

Two, 19-inch brass case Carlisle and Finch Co. searchlights fitted with Bausch & Lomb mirrors, electrically controlled from the pilot house are installed on the forward upper deck. There is complete, inter-communicating telephone system as supplied by the S. H. Couch Telephone Co.

Radio receiving apparatus is installed in the mess room, engine room



*Engine room of twin screw diesel river towboat William Dickinson*

In the crew's wash room the floor is laid with non-slip ceramic tile and the walls "porcelain" metal tile. The galley floor and walls are treated in the same manner, both in colors corresponding to the owner's trade containers.

The refrigerating apparatus consists of a white porcelain steel refrigerator with a capacity of 80 cubic feet, and a Frigidaire refrigerating unit. Drinking water is supplied by a self-contained Frigidaire unit.

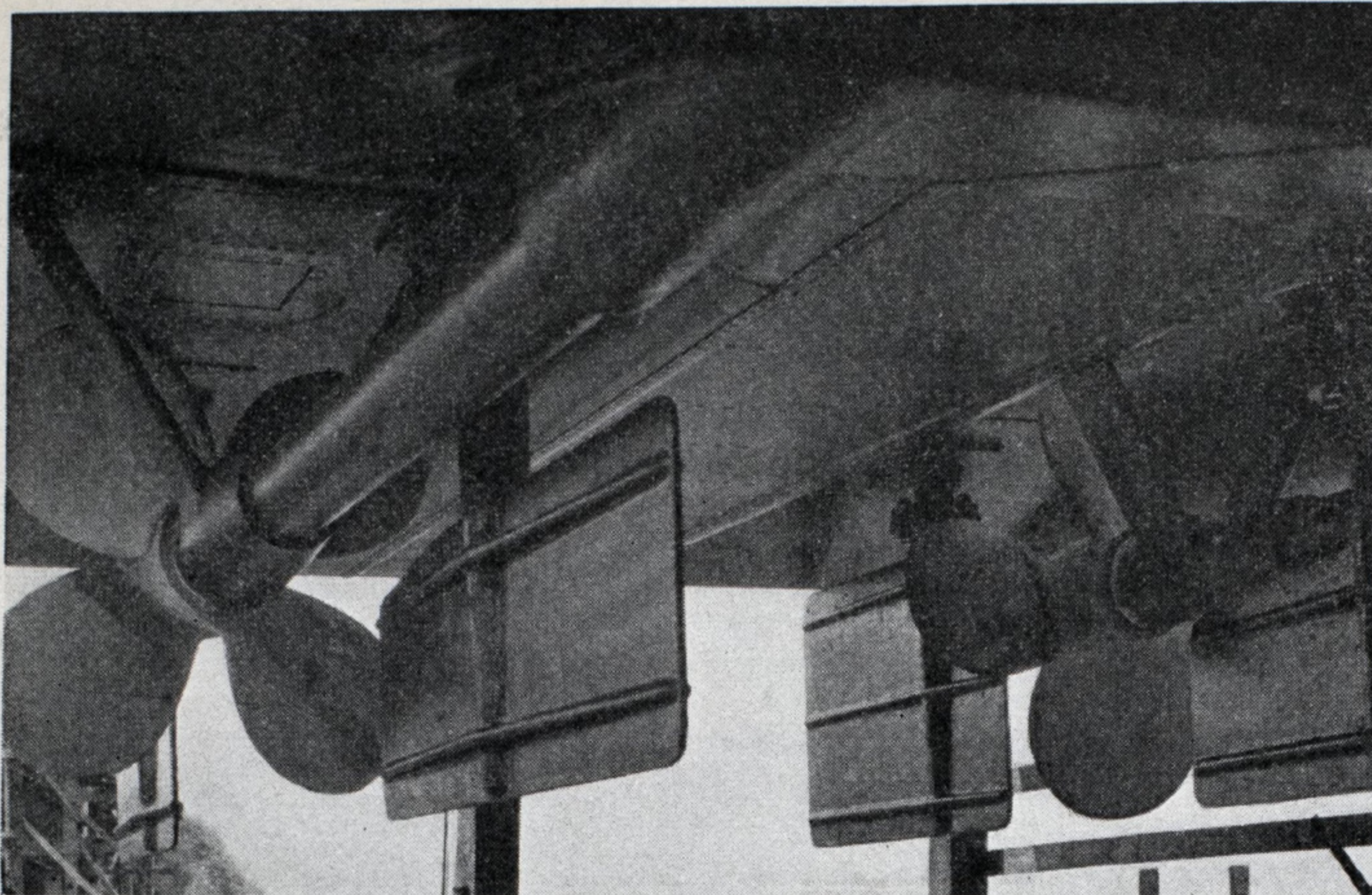
The steel deck in way of the crew's quarters is covered with battleship linoleum laid over special insulating foundation sheets of a type made by the Pittsburgh Porcelain Tile Co. Both the sheets and the linoleum are laid up with waterproof cement.

The air siren is of the "tyfon" type. The engine telegraphs by Cory Co. and the bells and ventilators by W. J. Tiebout. There is an 18-foot yawl equipped with a 16-horsepower outboard motor.

All standard and special air and water valves and the bilge manifolds, were furnished by the Crane Co. All oil and bilge piping is of copper.

This vessel was constructed under





*Under side of river towboat William Dickinson. Propellers in partial tunnels. One rudder forward and one rudder aft of each propeller*

the supervision of the American Bureau of Shipping and classified for the highest rating for river service.

During the latter part of last year the Marquette Cement Mfg. Co. placed four self-unloading bulk cement barges in service for the transportation of cement by water. These barges each have a capacity of 5000 barrels and are equipped with Fuller-Kenyon pumps for discharging into storage silos located at Memphis and St. Louis.

The barges are of steel construction with three longitudinal hoppers, each 144 feet long. Each of the hoppers is served by a screw conveyor into which the cement flows by gravity through manually operated control gates. At a point amidship the longitudinal con-

veyors discharge into a thwartship conveyor which in turn discharges into the hopper of a cement pump.

#### **A Unique Towing Service**

The action of the cement pumps in discharging the cement into the silos ashore consists in aerating the cement, which is done by discharging the pulverized cement by means of an electrically operated screw which feeds the powder into the air mixing lines for discharge ashore and the blowing out of the lines when the equipment is shut down. The necessary air and electrical current for the operation of the equipment aboard the barges is received from ashore.

The dimensions of the barges are

175 feet by 35 feet by 7 feet. The cement bins or hoppers extend four feet above the main deck and are covered with light plating made weather-tight by welding.

In undertaking the movement of bulk cement on the Mississippi river the Marquette company is a pioneer. Since the inauguration of the service the storage capacity at both of the terminals has been doubled and plans for the extension of the service are ready for approval.

The towboat WILLIAM DICKINSON is named in memory of William Dickinson, pioneer importer of Portland cement and former vice president of the Marquette Cement Mfg. Co.

The sister ship of the White Star motorship BRITANNIC, now building at Belfast, will be named GEORGIC. The new liner which will join the New York-Liverpool service of the line, will be an exact duplicate of the BRITANNIC being 680 feet long, 82 feet beam, 43 feet 9 inches deep and upwards of 27,000 gross tons gross register.

The GEORGIC will be powered by two 8-cylinder, double-acting, four-cycle motor engines of Harland B & W type, the cylinders being cooled by fresh water and the pistons oil cooled. The vessel is subdivided into 13 watertight compartments. Extending the entire length of the ship is a double bottom to carry fresh water, water ballast and oil.

Col. Benjamin C. Allin, for the past 12 years director of the port of Houston, resigned effective Dec. 31, and will become port manager at Stockton, Cal. Work has just begun on a \$6,000,000 port project at Stockton.

## **Twin Diesel Electric Installation in Gasoline Tanker**

**T**HE Gulf Refining Co., Jacksonville, Fla., has purchased two 180 horsepower six cylinder Buda-M. A. N. diesel engines, through the Gibbs Gas Engine Co., at Jacksonville. This is to be a twin engine installation for electric propulsion of

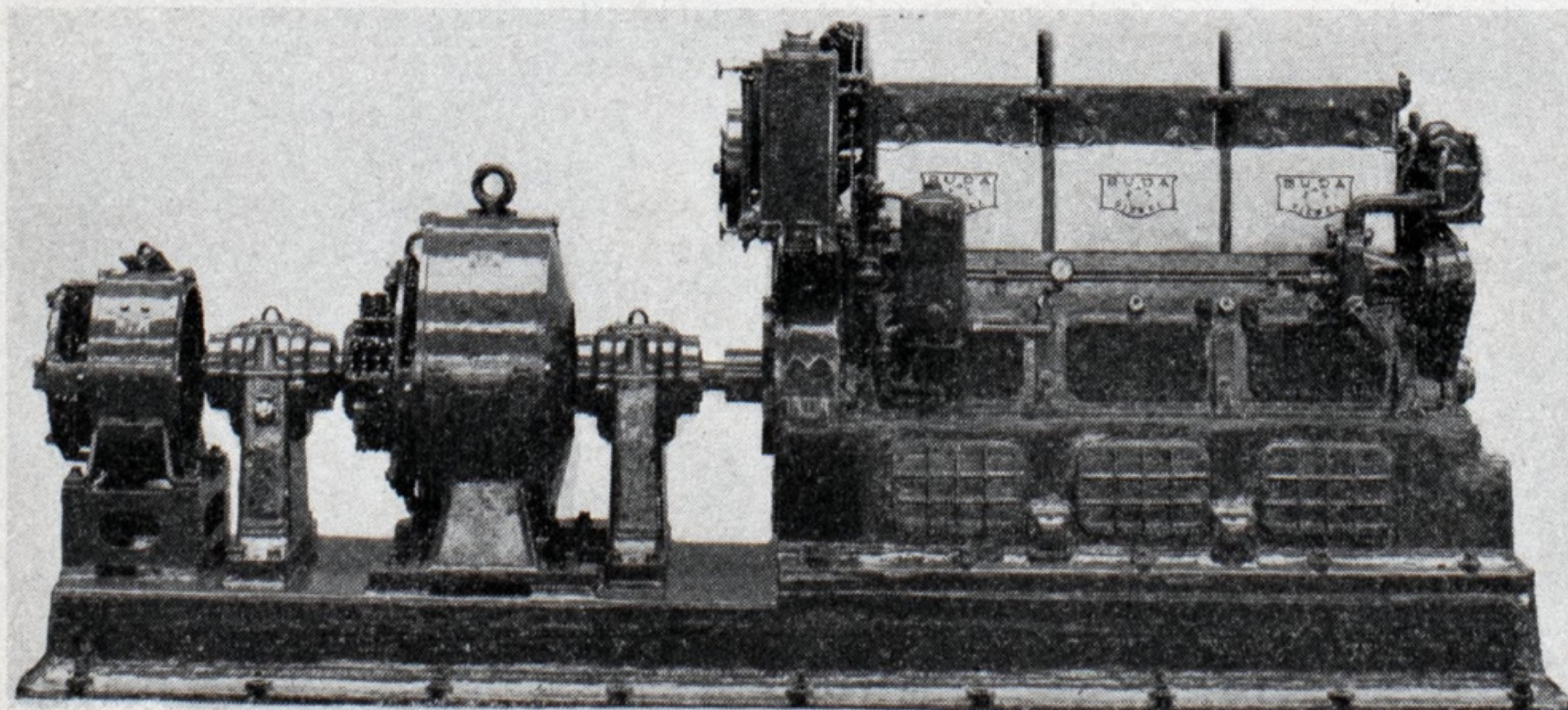
a gasoline tanker, intended for operation in Florida waters. The tanker is 149 feet overall, 32 feet wide, with a capacity of 117,000 gallons.

The Buda diesel is a high speed, light weight type, operating on the 4 stroke cycle principle and is man-

ufactured by the Buda Co., Harvey, Ill., under license from the M. A. N. company, Augsburg, Germany.

Each engine is mounted on a common base with a Westinghouse 85 kilowatt, 850 revolutions per minute generator, as shown in the accompanying illustration, and is completely equipped with pyrometers, motometers and tachometers. The light weight of this complete power plant makes it possible to carry a greater pay load than would have been possible with a heavy, slow-speed type of engine and generator.

The Gulf Refining Co.'s decision to purchase this type of equipment is based on the knowledge that Buda-M. A. N. diesel electric generator units are specially engineered to provide maximum protection against the ever-threatening fire hazard in the transportation of such a highly volatile cargo.





# New Canadian Freight Terminal Now in Full Operation

BY F. O. DAYTON

**T**HE Canada steamship lines, freight terminal site at Hamilton, Ont., was selected to achieve the maximum efficiency in freight handling, and is located conveniently for the movement of freight by ship, rail and truck. The structure has been planned so that its capacity can be increased greatly in future as traffic may warrant. The shed is in the form of a U. Its floor space is 80,000 square feet, the amount of floor space which can ultimately be provided being 202,000 square feet, additional areas of 21,000, 31,000, and 70,000 square feet having been made available. Railway siding connection is being provided.

A covered driveway is provided between the two sections of the shed. The driveway is crowned in the center, and the surface is of 3-inch British Columbia fir laid in 10-inch widths on half round cedar sleepers cut out from 6-inch logs and embedded in gravel eight inches deep. Within the shed, along both sides of the driveway, a saw tooth loading dock is provided, with a height of 3½ feet from driveway to shed floor, for the more convenient and rapid dispatch of trucks and freight, the indentations being of such depth that a truck may be placed alongside the platform in one, and if there is a trailer being handled by the truck, it can be placed in the adjoining indentation. A turning area is located about the middle of the shed, by widening of the driveway, to provide for quick turning of trucks. Shed doors are located in every third bay, centered to match up with the gangways and doors on the Canada Steamship line package freight steamers. The overall length of the dock is approximately 500 feet, and the width 220 feet, providing accommodation for two package freighters on each side of the dock, with a reserve berth along the end of the dock for one package freighter. Dredging has been done to the depth of 2 feet below low water.

The shed is of steel truss construction, the floor space entirely free from columns, with the trusses having a clear span of 73 feet, 8 inches, and clear head room of 13 feet from the shed floor. The roof is of plank and the roofing of tar and gravel. The shed sides and doors are of corrugated

galvanized iron, and natural lighting is provided by three continuous monitors throughout the length of the shed. The shed floor is of reinforced concrete construction, designed to carry a load of 600 pounds per square foot, and the floor is of 1½-inch hardwood, providing an ideal surface for trucking, with a minimum of dust and dirt. Doors are of the sliding type, with the exception of two large rolling steel doors giving access to the roadway in the shed from the main approach roadway to the terminal. These doors are operated mechanically.

Provisions have been made for six flush platform scales in the warehouse. In addition thereto wagon or truck scales are being installed near the entrance to the terminal.

Listed in the numerous media of handling freight are belt, slat and gravity conveyors, overhead cranes and trolleys, jib cranes, electric and gasoline trucks and tractors, the former using skids or platforms and the latter used to pull one or more trailers. There are freight elevators of various kinds and tubes and chutes of every type.

Conveyors can be made to handle most any kind of freight in factories and warehouses, but on and off ships the problem is somewhat different. In the first place, all freight must be handled in weights anywhere from ten to 1000 pounds or more. A conveyor designed to handle such miscellaneous freight must be strong and therefore would be heavy and cumbersome and difficult to move on and off the ship.

The use of skids or platforms is adopted in instances like the above

The author, F. O. Dayton, is division freight agent of the Canada Steamship lines, Hamilton, Ont.

and the results are quite satisfactory. The use of skids eliminates several handlings which fact reacts to the ultimate benefit of shipper and consignee.

Freight shipments are unloaded at the Canada Steamship lines terminal direct from ships or trucks and placed on platforms or skids and then transferred with hand lift trucks or gasoline lift trucks to the place required in the warehouse.

The terminal is equipped with seven gasoline trucks and a large number of the hand type lift equipment. Four five-ton monorail cranes have been installed to handle freight from one side of the dock to the other or from truck to ship, or from one side of the shed to the other, giving a flexible means of handling heavy loads.

The handling of package freight on the Great Lakes and St. Lawrence river has reached a new high standard of efficiency this season. Canada Steamship lines, who have been pioneers in the rapid improvement of package freight handling methods through the operation of specially designed steamers and the construction of modern terminals, have installed steel freight elevators in package freighters. All these elevators are located amidships and are capable of carrying a load of five tons. They measure 15 feet, 8 inches by 7 feet, 9 inches. The floor of the elevator is flush with the spar deck. Freight loaded through the gangway doors or on to the spar deck can be trucked directly to the elevator and lowered with speed and security directly to the hold.

## European Owners Install Exhaust Turbines

The Messageries Maritimes have recently placed an order for the conversion of five vessels, using exhaust turbines on the Bauer-Wach system ranging in total output from 3500 to 4000 indicated horsepower each. The Compagnie Generale Transatlantique is to install this type of machinery, to develop altogether 7000 indicated horsepower in the new steamer SAN PEDRO, now under construction by Harland & Wolff, Belfast. Similarly, three vessels of the Federal Steam Navigation Co., London, are being fitted with exhaust turbines by Swan, Hunter & Wigham Richardson of Newcastle-on-Tyne. These orders placed early in December, bring the number of vessels equipped with combined reciprocator and Bauer-Wach exhaust turbine drive up to 184, some for ship conversions and others for new vessels.



Aerial view of Canada Steamship lines terminal at Hamilton, Ont.



# Electricity Plays an Important Role in Marine Progress

By H. C. Coleman and J. D. Schmidt

**T**HE year 1930 takes its place in marine history of the United States with a record of activity, progress and accomplishment in shipbuilding and marine engineering, which has not been approached since the busy days of the World war. Our merchant marine will be strengthened by the addition of a fleet of fine ships now under construction or in process of design. Some will be propelled by means of electricity. All will have electrically driven auxiliaries. Electrical appliances will add to the comfort and convenience of passengers.

During 1930, the machinery for one of the new Dollar liners was completed and shipped. This included turbine electrical propulsion machinery and complete auxiliary equipment. This fine new passenger and cargo vessel being built at Newport News is to be driven by twin screws, each direct connected to a 13,250 horsepower, 4000 volt, 3 phase, 44.3 cycle, 133 revolutions per minute synchronous motor. The motors will be supplied with power from two 10,200 kilowatt, 2660 revolutions per minute turbine generator sets, the turbines being designed for 275 pounds throttle pressure, 200 degrees Fahr. superheat, and 28½ inches vacuum. Power for excitation and auxiliaries will be furnished by four 500 kilowatt, 240/120 volt, direct current turbine generator sets, of new high efficiency light weight design. All auxiliaries will be electrically driven, except boiler feed pumps and main lubricating oil pumps.

## Turbine Electric on New Cutters

During the present year, four new coast guard cutters built by the General Engineering & Dry Dock Co., Alameda, Calif., have been placed in service. These vessels have turbine electric propulsion plants and complete electric auxiliaries supplied with power from two alternating-current auxiliary turbine generator sets. The propulsion plant on each vessel includes a single main turbine generator unit and a 3220 horsepower synchronous motor. The tenth and last cutter of this series is now being built at the Staten Island plant of the United Dry Docks Co., New York city. This ship is to have the same

type of propelling and auxiliary plant as the four completed this year. This is the largest fleet of duplicate turbine electric propelled vessels in the world.

## Geared Turbine for Large Tug

An order has been placed recently for geared turbine propelling machinery for a large tug for general lakes service. An interesting feature of this vessel will be that the entire machinery installation including all auxiliaries will be furnished and serviced by the turbine manufacturer.

The pioneer installation of turbine electric drive on a river towboat has now been made in the INDIANA and LOUISIANA owned and operated by the Mississippi Valley Barge Line Co. in scheduled freight service between New Orleans and Cincinnati. Each towboat is equipped with 2000 shaft horsepower twin screw, turbine electric drive, utilizing a single main turbine driving a double unit direct current generator and exciter. Coupled to each propeller is a double unit, 1000 horsepower, 185 revolution per minute motor. Complete pilot house control is provided with individual control of the screws. In addition, the usual engine room control station is fitted. The combination of the high-speed turbine as prime mover with direct-current electrical equipment, provides a very economical propelling plant as well as one which gives the necessary flexibility and ease and simplicity of control so desirable in a boat which must be maneuvered almost constantly as is true of towboats handling large numbers of barges on the rivers. These two boats are also completely fitted with electric auxiliaries which are supplied with power, when the boat is under way, from exciter driven by the main turbine.

An interesting new type of ship was completed in November on the Great Lakes. This is the self-propelled, self-unloading sand and gravel dredge and cargo carrier J. R. SENSIBAR. A complete illustrated description of this vessel appeared in the December issue of MARINE REVIEW. The propulsion plant consists of a single main turbine generator unit and a 3000 horsepower 100 revolution per minute wound rotor induction motor and control station. This equipment was built originally for use on shipping board vessels of the INVINCIBLE class. The unit used on the SENSIBAR was never installed, and was kept in storage until its pur-

chase for installation in this vessel.

All of the remainder of the electrical equipment on this ship is new and was designed for the particular applications involved. The most important item probably is that comprising the main pumping equipment used for dredging sand and gravel. This consists of two 30-inch centrifugal pumps of 30,000 gallons per minute capacity. Each of these pumps is driven by a double unit, 1500 horsepower, 2200 volt, 415 revolutions per minute induction motor. These motors are supplied with power from the propulsion generator. In addition to the large pump units, there are 16 motors and controls varying from 250 horsepower to 20 horsepower in size. These motors are utilized for driving the jet pumps, various engine room auxiliaries, and the conveyor systems. Transformers are provided for supplying low voltage power for lighting. A separate auxiliary turbine generator set with a 750 kv-a. generator and a 75 kilowatts 125 volt direct-current generator may be used to supply auxiliary power.

Attention is being given to increasing the power and speed of suitable reciprocating engine vessels by the addition of an exhaust turbine arranged to take steam from the reciprocating engine and to expand it to a lower pressure than would be feasible with the engine alone. The additional turning effort thus obtained is applied to the same propeller shaft through a suitable speed reducing medium.

## Exhaust Turbine Adds Power

An exhaust turbine of approximately 1000 shaft horsepower capacity permanently geared to the propeller shaft has been installed and placed in satisfactory operation on the steamship SUSAN V. LUCKENBACH. In the case of a turbine so connected, it is obvious that provision must be made for astern operation, and this has been accomplished by means of an ingenious application of the hydraulic relay in connection with an oil impeller governor on the turbine.

In the field of diesel electric drive, there is an interesting installation on a small gasoline tanker built for the Gulf Refining Co. at Jacksonville, Fla. This self propelled tanker will be utilized to deliver gasoline to motorboat and yacht filling stations along the Florida coast. It will have a capacity of 117,000 gallons and will be of the stern, paddle-wheel river type. The stern wheel will be split and each half driven by a 100 horsepower direct current motor through a gear unit mounted on the fantail. This gear unit will be a combined bevel and spur gear, allowing the motor to be mounted forward in the covered portion of the hull. Power will be supplied by two highspeed diesel engine generating sets, and complete control will be provided for the pilot house.

H. C. Coleman is manager of the Marine Engineering Department at East Pittsburgh and J. D. Schmidt is a member of the Engineering Department at South Philadelphia of the Westinghouse Electric & Mfg. Co.



During 1930, the Atlantic Refining Co. placed in operation another diesel electric vessel in its growing fleet of ships with this form of drive. This was the tug VANDYKE IV, which is fitted with two 130 kilowatt main generators driven by diesel engines and a single, 425 horsepower propulsion motor, with pilot house control. This makes a total of ten diesel electric propelled ships which the Atlantic Refining Co. has added to its fleet, and two more large tankers with the same form of drive are now being constructed in England.

#### Diesel Electric on a Yacht

The first steel power yacht to be equipped with the diesel electric system of propulsion is now being built at the yards of the Bath Iron Works, Bath, Me. It is being built to the order of George M. Pynchon, New York, and will be 143 feet long, with beam of 25 feet and full speed of approximately 14 knots. It will be propelled by two 330 horsepower, direct-current motors on twin screws supplied with power from two 400 horsepower diesel engine generator sets. As is usual in the case of this form of drive, pilot house control is to be utilized.

The high speed cargo winch motor and control combination which was developed during the latter part of 1928 and 1929 in connection with the shipping board diesel program has found useful application on a number of vessels. The most important ships which have been so equipped, or cases where such equipment is now being built, include the Alaska Steamship Co. vessel ALEUTIAN, formerly the S. S. MEXICO, which has six 40 horsepower highspeed winches; the motorship CITY OF NEW YORK, which has twelve 25

horsepower and two 35 horsepower winches, and a new motorship being fitted out by the Ford Motor Co., which has eight 25 horsepower winches, and the two new cabin liners being constructed for the United States lines, each of which is to have twenty-two 35 horsepower, highspeed winches.

One of the most notable installations of deck auxiliaries during 1930 was that on the new Ward Liners, MORRO CASTLE and ORIENTE. Each of these vessels has ten 25 horsepower winches and two 35 horsepower winches in addition to a 75 horsepower anchor windlass and two 30 horsepower capstans.

All of the new passenger and cargo vessels being built are to be equipped with electric auxiliaries in the engine

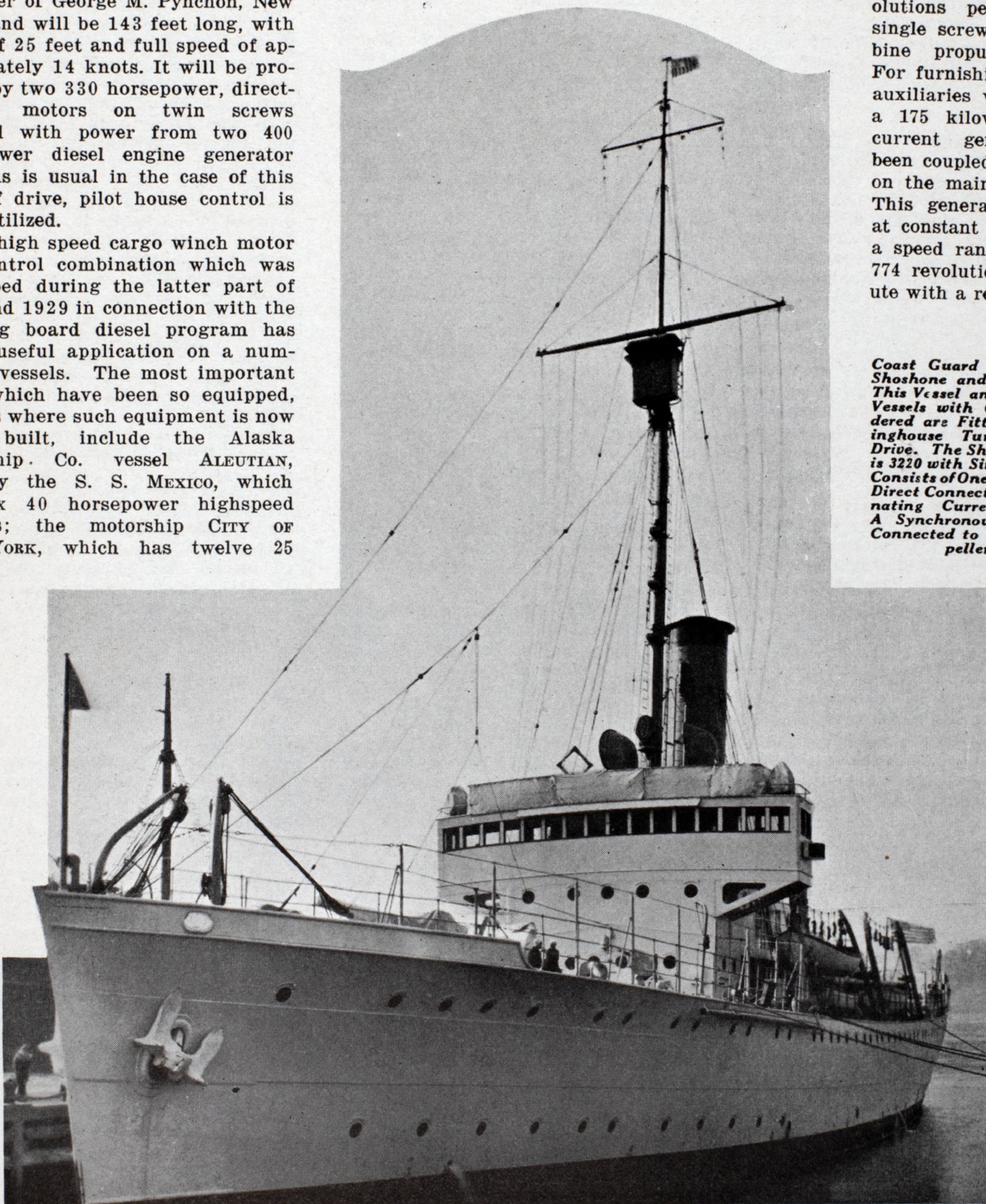
room and on other underdeck applications. Notable among the installations being made in 1930 along this line are the New York & Porto Rico vessel BORINQUEN and the three large liners being built for the Matson line at Fore River, and the four vessels being built at Camden for the Export line.

#### Auxiliary Power From Main Unit

A new development in the method of supplying auxiliary power on a geared turbine propelled vessel was brought out this year on the two new tankers built for the Standard Shipping Co. by the Federal Shipbuilding Co. The first of these 18,000-ton tankers, the G. HARRISON SMITH has been in service for approximately two months. This vessel has a 4000

shaft horsepower, 75 revolutions per minute single screw geared turbine propulsion plant. For furnishing power to auxiliaries when at sea, a 175 kilowatts direct-current generator has been coupled to a pinion on the main drive gear. This generator operates at constant voltage over a speed range of 490 to 774 revolutions per minute with a regulator.

*Coast Guard Cutter of the Shoshone and Chelan Class. This Vessel and Eight Sister Vessels with One More Ordered are Fitted with Westinghouse Turbine Electric Drive. The Shaft Horsepower is 3220 with Single Screw and Consists of One Steam Turbine Direct Connected to an Alternating Current Generator. A Synchronous Motor is Connected to the Single Propeller Shaft*





# Late Decisions in Maritime Law

## Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review

By Harry Bowne Skillman

Attorney at Law

**W**HEN live ashes are taken from a furnace to be dumped upon a wooden scow, the operation is so obviously fraught with danger as to demand the exercise of a high degree of care to provide for wetting them sufficiently to prevent a fire. When, as it appeared in the case of *Bartley Scow Corp. v. J. V. Petrie & Son, Inc.*, 37 F. (2d) 58, they are dumped so hot as to burn and damage the scow, those who do the dumping are presumptively negligent.

\* \* \*

**I**N *RE Lee Transit Corp.*, 37 F. (2d) 67, involved a petition for limitation of liability on account of the claim of a deckhand for personal injuries sustained while in discharge of his duties on petitioner's tug. The court held that an employee is not necessarily at fault in exposing himself to risk, which a volunteer would not be justified in assuming, saying, in part: "No doubt the standard always must be the proper balance between the risk to life or limb and that to the property, and this of course involves the imminence and gravity of the possible injury and of the possible damage. A servant may not greatly hazard his safety for a trifle; it does not follow that he may not incur a slighter chance to protect property of value from present danger. The real question is whether his relation as employee justifies more disregard of himself than if he had no duty to perform."

\* \* \*

**T**HE price which a city paid for a vessel was competent evidence of her value in a ferryboat company's limitation of liability proceeding, said the court in *In re Union Ferry Co. of New York and Brooklyn*, 37 F. (2d) 95, and the consideration expressed in the bill of sale presumptively stated, subject to refutation, the price paid.

\* \* \*

**T**O ALLOW a ferryboat to pass 100 feet away from tugs towing a partially submerged barge, where neither the tugs nor the barge carry any warning signal, those in charge of the tugs well knowing that the ferryboat is bound for her nearby slip, is coming with a strong ebb tide, and that a distance of almost 300 feet beyond the sterns of the tugs contains a danger, which may result not only in damage to property, but loss to life, and yet give no warning whatever of such possible danger, by whistles, shouts, or gestures, relying solely on the hope that the master of the ferryboat can see the obstruction, or on the belief that he will not make a turn within that space, is in itself sufficient evi-

dence of negligence on the part of those in charge of such tow.—*HAMMOND*, 37 F. (2d) 184.

\* \* \*

**T**HE general rule is well established, it was declared in the case of *FREDENSBRO*, 38 F. (2d) 501, that an underwriter who has paid a loss is entitled to recover what he has paid by a suit in the name of the assured against the carrier who caused the loss.

\* \* \*

**T**HE fact that a voyage was rough, and that there was a great deal of pounding in the forward part of the ship, did not, according to the case of *CAMERONIA*, 38 F. (2d) 522, relieve the shipowner from liability for damage to cargo coming in contact with sea water, under a provision of the bill of lading that neither the carrier nor the ship would be responsible for loss or damage arising or resulting from perils, dangers and accidents of the sea or other navigable waters.

\* \* \*

**A**N OVERTAKING vessel has the duty to keep out of the way and to avoid the risk of collision. If in doubt as to whether the other ship is converging or parallel, she is bound to assume the first; ambiguities must be resolved in favor of safety. It must always be remembered that it is the risk of collision, not the collision itself, that masters must avoid.

\* \* \*

**A** BRIDGE spanning a navigable river is an obstruction to navigation tolerated because of necessity and convenience to commerce upon land. Such a structure, it was held in the case of *KARD*, 38 F. (2d) 84, must be so maintained and operated that navigation may not be impeded more than is absolutely necessary; the right of navigation being paramount. It is incumbent upon the owner that the bridge be so constructed that it may be readily opened to admit the passage of craft, and maintained in suitable condition thereto. It is also his duty to place in charge those who are competent to operate the bridge, to watch for signals, and to open the bridge for the passage of vessels, and for the performance of such delegated duty he is responsible. A vessel, having given proper signal to open the bridge and prudently proceeding under slow speed, has, in the absence of proper warning, the right to assume that the bridge will be timely opened for passage. She is not bound to heave to until the bridge has been swung, or raised and locked, and to critically examine the situation before proceeding, but may carefully proceed at

slow speed upon the assumption that the bridge will open in response to the signal, and may so proceed until such time as it appears by proper warning, or in reasonable view of the situation, that the bridge will not be opened.

\* \* \*

**I**N THE case of *ALVAH H. BOUSHELL*, 38 F. (2d) 980, it appeared that a towing company contracted to tow a ship to a given destination, necessitating the use of two of its tugs. The ship was taken over and placed in the control of the tugs, under the specific direction of the master of one of the tugs. That master took command of the ship and tugs, and was proceeding en route in charge of the flotilla directing same from the ship's bridge, as is customary, and while so engaged, pursuant to the towage undertaking, a collision occurred, as a result of the fault in navigation of the tow thus in charge of the master of one of the tugs, so placed in command by the towing company. Under such circumstances, said the court, both tugs are responsible and liable for damages arising from such collision, where as in this case, both were participants in the venture and undertaking, and both were at fault in bringing about the collision. The master, so in control of the undertaking, was, in such circumstances, to all intents and purposes, the master of both vessels, and the two tugs constituted the unit to be surrendered to justify a limitation of liability.

\* \* \*

**A** FFIRMING the judgment in 33 F. (2d) 211, the court, in the case of *United States v. Munson Steamship line*, 37 F. (2d) 681, declared that water transportation unconnected with transportation by rail is not subject to the provisions of the Interstate Commerce act that carriers shall file, etc., schedules of rates, etc., water carriers being subject, not to the interstate commerce commission, but to the United States shipping board, and are required to file schedules of maximum rates with that board, which is given supervisory power over their rates and practices. It was held that a water carrier receiving merchandise from a rail carrier and issuing a bill of lading to the shipper under a separate contract with him was not taking part in transportation with the rail carrier under "common arrangement" with the rail carrier within the meaning of the Interstate Commerce act, so as to require filing schedules of rates with the interstate commerce commission.



# Marine Business Statistics Condensed

## Record of Traffic at Principal American Ports for Past Year

### New York

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	485	2,194,780	470	2,144,883
October .....	530	2,546,629	548	2,636,414
September .....	591	2,877,309	556	2,693,493
August .....	554	2,716,668	586	2,855,323
July .....	578	2,717,787	616	2,815,336
June .....	585	2,722,344	559	2,596,692
May .....	592	2,697,642	643	2,955,826
April .....	558	2,662,532	574	2,601,047
March .....	546	2,490,027	562	2,470,228
February, 1930....	508	2,280,543	512	2,272,393

### Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)  
(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	87	226,006	46	122,107
October .....	85	231,460	53	144,530
September .....	87	232,781	52	147,365
August .....	92	244,206	55	144,201
July .....	96	246,866	68	151,861
June .....	92	240,323	72	169,627
May .....	105	271,618	64	143,167
April .....	89	236,257	63	177,289
March .....	96	285,754	58	190,093
February, 1930....	86	248,417	67	194,809

### Boston

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	77	248,220	61	232,826
October .....	96	321,092	65	208,695
August .....	115	305,649	101	299,454
July .....	152	325,325	110	222,555
June .....	152	325,325	110	222,555
May .....	163	362,849	114	274,019
April .....	105	298,347	76	203,497
March .....	85	271,423	57	193,317
February, 1930....	87	281,012	44	159,767

### Portland, Me.

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	21	46,182	20	40,916
October .....	17	41,667	20	45,989
September .....	32	53,423	28	49,428
August .....	36	69,765	36	72,232
July .....	42	83,987	42	84,939
June .....	39	70,119	34	60,536
May .....	31	46,797	33	52,619
April .....	17	47,308	20	52,313
February, 1930....	26	71,155	21	57,834

### Providence

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	13	46,927	5	18,597
October .....	10	37,269	5	22,305
September .....	6	28,972	3	16,265
August .....	7	29,532	4	16,388
July .....	10	36,403	5	19,623
June .....	6	26,588	4	18,640
May .....	7	28,953	6	23,794
April .....	10	44,564	6	24,407
March .....	7	31,668	5	23,382
February, 1930....	12	44,382	7	28,774

### Portland, Oreg.

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	30	122,020	53	208,266
October .....	40	155,991	54	207,118
September .....	30	122,022	46	182,641
August .....	32	125,137	46	174,985
July .....	30	118,919	53	193,425
June .....	31	122,569	48	175,167
May .....	32	122,714	49	179,845
April .....	32	121,646	46	167,358
March .....	26	103,710	44	159,420
February, 1930....	31	123,100	47	185,192

### Baltimore

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	116	384,877	117	376,725
October .....	139	452,905	127	402,155
September .....	150	475,928	138	424,976
August .....	130	412,209	125	396,421
July .....	132	444,823	144	455,226
June .....	153	486,645	157	481,837
May .....	152	457,169	150	463,958
April .....	166	502,204	179	529,912
March .....	141	438,638	139	433,168
February, 1930....	139	432,422	142	431,664

### Norfolk and Newport News

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	22	65,716	56	141,242
October .....	21	72,517	58	153,410
September .....	21	48,971	66	168,922
August .....	28	66,765	50	139,710
July .....	27	63,721	60	144,446
June .....	23	52,701	43	109,274
May .....	28	53,214	53	131,768
April .....	14	35,914	61	178,792
February, 1930....	21	47,835	59	180,510

### Jacksonville

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	14	30,105	10	13,048
October .....	14	27,810	14	27,016
September .....	12	26,442	13	26,356
August .....	15	29,565	12	20,856
July .....	6	14,312	8	20,739
June .....	10	25,129	12	23,737
May .....	14	32,001	19	51,210
April .....	13	23,378	13	27,999
March .....	17	26,625	12	23,963
February, 1930....	14	35,002	13	31,353

### Key West

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	49	63,307	50	64,389
October .....	50	61,288	49	60,432
September .....	48	64,968	48	64,742
August .....	50	61,440	50	61,666
July .....	56	68,968	55	69,397
June .....	57	69,679	56	68,653
May .....	104	120,788	108	120,160
April .....	89	90,105	82	90,249
March .....	93	89,490	76	86,235
February, 1930....	85	90,050	70	87,109

### Mobile

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	.....	.....	.....	.....
October .....	.....	.....	.....	.....
September .....	83	184,276	81	171,679
August .....	102	190,362	96	176,488
July .....	113	211,989	95	173,549
June .....	113	211,446	111	212,639
May .....	98	169,700	106	203,070
April .....	115	225,516	119	235,115
March .....	131	230,484	126	236,119
February, 1930....	104	254,408	116	276,137

### Seattle

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	59	255,728	57	245,592
October .....	57	246,957	63	272,114
September .....	62	268,203	58	250,301
August .....	48	200,602	48	209,109
July .....	54	248,954	60	261,746
June .....	49	215,525	53	228,554
May .....	54	235,178	53	222,715
April .....	55	230,429	55	217,705
March .....	52	205,674	59	245,363
February, 1930....	55	231,213	47	195,156

### New Orleans

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	187	555,053	194	541,671
October .....	218	633,652	228	672,782
September .....	210	589,459	218	605,239
August .....	220	600,786	241	666,625
July .....	270	697,526	245	653,562
June .....	233	606,340	239	626,307
May .....	260	686,543	251	662,383
April .....	226	712,630	261	701,159
March .....	255	703,361	263	699,493
February, 1930....	263	715,681	237	630,673

### Charleston

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	.....	.....	.....	.....
October .....	.....	.....	.....	.....
September .....	19	54,863	19	69,530
August .....	13	34,274	13	24,742
July .....	25	70,538	25	51,805
June .....	18	42,196	18	46,140
May .....	20	50,484	20	50,484
April .....	22	49,651	26	56,022
March .....	32	70,250	24	60,834
February, 1930....	20	52,660	18	44,494

### Galveston

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	.....	.....	.....	.....
October .....	.....	.....	.....	.....
September .....	46	117,185	119	337,991
August .....	37	82,429	97	277,077
July .....	40	93,999	83	249,064
June .....	28	60,622	63	171,223
May .....	35	59,807	82	240,137
April .....	26	39,332	66	183,706
March .....	24	31,987	82	235,656
February, 1930....	26	48,200	68	197,140

### Los Angeles

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	
November, 1930....	219	618,855	206	616,266
October .....	236	680,430	217	628,733
September .....	255	697,262	218	616,018
August, 1930....	211	631,167	221	621,088
July .....	230	687,670	196	611,768
June .....	240	632,188	225	641,270
April .....	214	639,153	200	637,922
March .....	211	682,547	218	677,011
February, 1930....	177	580,092	165	542,392

### San Francisco

(Exclusive of Domestic)				
Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
ships	tonnage	ships	tonnage	



# Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Shipping Board Loans Made, Authorized or Pending

**R**EPORTS from Newport News Shipbuilding & Drydock Co. show that considerable new work is under way at that plant. This yard is building the scout cruiser *AUGUSTA* for the navy and it is expected that the vessel will be delivered during February, 1931. Two vessels are under construction for the Dollar Steamship Lines Inc., the first of which has already been launched and is to be delivered some time in July. The second vessel will probably be delivered in October or November, 1931. The *S. S. FLORIDA*, building for the Peninsular & Occidental Steamship Co., is to be launched some time in March and delivered in May, 1931.

The company is also building three vessels for the United Mail Steamship Co., a subsidiary of the United Fruit Co. Deliveries of these new vessels are expected to be made in December, 1931, February, 1932, and April, 1932. The company recently received a contract from the navy department for the construction of an airplane carrier. The Newport News yard was recently the low bidder for the construction of three vessels for the Colombian Steamship lines and also three vessels for the Eastern Steamship lines. Contracts for building these new vessels have not as yet been signed because of other matters which must be decided by the owners before proceeding with the construction.

The department of commerce reports that American shipyards to Nov. 1. were under contract to build, for private ship owners, 127 vessels aggregating 366,404 tons.

## Bids Asked on Patrol Boats

The United States coast guard has invited bids for building five or six or seven 165-foot patrol boats as described in the specifications dated Nov. 1930, and shown on the design plans. The bids for the construction of these patrol boats will be opened at 2:00 p.m., Jan. 5, 1931. Particulars of the boats are: Length, over all 165 feet 0 inch; beam, molded, at main deck 25 feet 3 inches; displacement, full load, about 300 tons; diesel engines, twin screw shaft horsepower, total 1300.

The first boat shall be completed and delivered not more than 300 days after date of receipt of notice to proceed and subsequent boats shall be

completed and delivered at intervals of not more than 25 days. Delivery dates may be anticipated as desired by the contractor.

Specifications and drawings for the boats may be obtained by shipbuilding companies from the commandant, United States coast guard, treasury department, Washington, D. C.

Bidders must possess satisfactory financial resources, technical organization, and plant facilities to assure full completion of the boats in the contract time. Attention is invited to paragraph 16 of the standard government instructions to bidders: No deposit for plans, bid bond 25 per cent of bid, performance bond 75 per cent of bid, liquidated damages \$100.00 per day per boat, partial payments will be made.

## Build Largest Dry Dock

The world's biggest dry dock will be built at Southampton to accommodate the new giant Cunarder, it was announced Nov. 28 by the Southern railway, which will build it, with government assistance.

The new dock will be 1200 feet long 135 feet wide, and 45 feet deep.

The Southern railway directors also have decided to begin immediately on the second stage of the Southampton docks extension project. These two works will provide employment for a considerable number of persons for some years, and will ensure Southampton keeping its place among the world's best equipped and most efficient ports. The entire project will cost about \$65,000,000.

The railway company intends to reclaim about 200 acres of mud land, now washed by the tide, for industrial sites close to deep-water berths. Work on the first part of the scheme, which is to cost \$15,000,000, is nearly complete.

## New Liner Leaves Yard

The new turbine electric liner *ORIENTE* left the yards of the Newport News Shipbuilding & Dry Dock Co. Dec. 17 and arrived in New York the following morning. This latest addition to the American merchant marine tied up at Pier 14 East River, foot of Wall street, and underwent a careful grooming preparatory to sailing on her maiden voyage for Havana.

The *ORIENTE* is the second vessel in

a \$10,000,000 shipbuilding program of two sister ships to be completed in the last several weeks by the Agwi lines for the Ward line's New York-Havana express service. The first vessel, the *MORRO CASTLE*, which recently entered service, has exceeded the expectations of her owners and judging from the *ORIENTE*'s performances on her sea trials of a few weeks ago she will make her sistership look to her laurels.

Like the *MORRO CASTLE*, the *ORIENTE* will maintain an average sea speed of 20 knots which means that these vessels have the distinction of being probably the fastest turbo-electric liners afloat. This speed will also enable the liners to cover the distance between New York and Havana in the fast time of 60 hours, a considerable improvement over the Ward line's former running time of 72 hours. This improved speed also brings the new vessels within striking distance of the best rail time between New York and Havana which is 45 hours and includes transfer at Key West to steamer.

The *ORIENTE* and *MORRO CASTLE* are vessels with a length of 508 feet with a beam of 70 feet 9 inches. Each has luxurious accommodations for about 500 passengers. The vessels are identical with the exception of interior decorations of the public rooms and staterooms which gives each a distinctive note.

The lighthouse service of the department of commerce has awarded contracts for two tenders to the Hampton Roads Ship Building Co., Portsmouth, Va., the contracts being \$342,975 and \$344,975 respectively.

## Launch Steam Tanker

The steam tanker *COMET* was launched recently from the yards of the Sun Shipbuilding and Drydock Co. at Chester. The vessel was christened by Miss Gwendolyn B. Corwin, of New York.

The *COMET* was built by the Sun company for the Standard Transportation Co., a subsidiary of the Standard Oil Co., of New York. The vessel is 9000 tons gross, is 480 feet in length by 65 feet 9 inches beam and has a depth of 37 feet.

Unlike many of the craft now being built with diesel engines, the *COMET* will be equipped with steam reciprocating type of propelling power.



## New Submarine Made Safe for Modern Operation

The United States newest undersea boat, the V-5, according to naval authorities, is probably the safest ship that ever sailed under the sea. From the original American submarine under 100 feet in length this new vessel has been developed into an armored craft which is 371 feet long, with 33 foot beam, drawing 16 feet of water.

In making provision against the dangers which have trapped men in sunken submarines the V-5 has been equipped with more than 100 safety devices of various kinds.

There is an extra "lung" for every member of the crew. The "lung" is a new submarine escape appliance something like a gas mask, which goes over the head and gives a man protection as he swims up to safety from a crippled undersea craft.

There are three periscopes and arrangement which enables the ship to be maneuvered directly to an objective even if one or two of the periscopes are broken or the sections in which one or two of the periscopes are located in some way are rendered unsafe.

The V-5 has three escape hatches: One through the conning tower and the others forward and aft from the torpedo room. These hatches are so arranged that in case of an emergency it will be possible to save the entire crew.

A series of compartments or escape locks are built into these hatches. A number of the crew with extra "lungs" might pass through these series of locks. At the last lock there is a door which permits the men to escape from the vessel into the sea.

There are banks of valves which control every piece of machinery on board the vessel. The craft is divided into a series of bulkheads, which can be shut off from each other instantly and become air-tight and watertight. Between each bulkhead there is a complete set of automatic and manual controls which permit the vessel to be maneuvered from any one

of a number of places in case of a situation in which the other bulkheads are damaged.

These controls also operate the ventilating system, the diving and raising machinery and the communication system. As a result of these multiple control systems, the V-5 can be damaged in a number of places and yet the men can maintain life, handle the ship and operate the communication system for contact with any ships outside and arrange for the rescue of the crew.

The V-5 carries a most sensitive radio apparatus, not only for sending and receiving messages, but also for listening to the approach of enemy vessels while it lies submerged.

## Complete New Diesel Yacht

The twin screw diesel yacht NORTHWIND was recently completed for Charles M. Clark of New York City by the Manitowoc Shipbuilding Corp., Manitowoc, Wis., from designs by Cox & Stevens, Inc. This new craft is 113 feet 5 inches long at the waterline, 22 feet beam, and 7 feet draft. She is powered with two 8-cylinder Winton diesel engines of 300 horsepower each at 720 revolutions per minute. On her trial runs the vessel made a speed of 14 miles per hour.

The deck houses are entirely of steel, the main one being continuous and having the dining saloon located in the forward end with the pantry directly aft with dumb waiter service from the galley below.

The owners and guest quarters are located in the cabin deck in the after part of the vessel.

The galley contains an oil-burning range, large three-compartment refrigerator, store room, dumb waiter, and hot water tank. Quarters are provided in the forecastle for six men.

The engine room contains, besides the main engines, two 15 kilowatt Hill-Diesel generator sets, Winton fire and bilge pump, Nash bilge pump, oil fired heating boiler, two Delco water systems for sanitary salt and fresh water, Exide storage batteries, and De-Laval fuel oil separator.

## Hold Trial Runs of New British Motorship

The twin screw motorship WINCHESTER CASTLE built by Harland & Wolff, Ltd. for the Union-Castle Mail S. S. Co. Ltd., left Belfast the latter part of October for her official trial trip. The WINCHESTER CASTLE, pictured in the illustration at the bottom of this page, made her maiden voyage in the South African mail service from Southampton. She is to be followed early in 1931 by a sister ship, the WARWICK CASTLE, which is now nearing completion at Belfast.

The following are the principal dimensions of the new vessel: length between perpendiculars, 630 feet no inches, breadth molded 75 feet no inches, depth molded 44 feet 6 inches, and gross tonnage, 20,109 tons.

This new motorship is designed on modern lines with a cruiser stern and two low funnels. Accommodations are provided for 756 first, second and third class passengers.

## Canadian Towboat Order

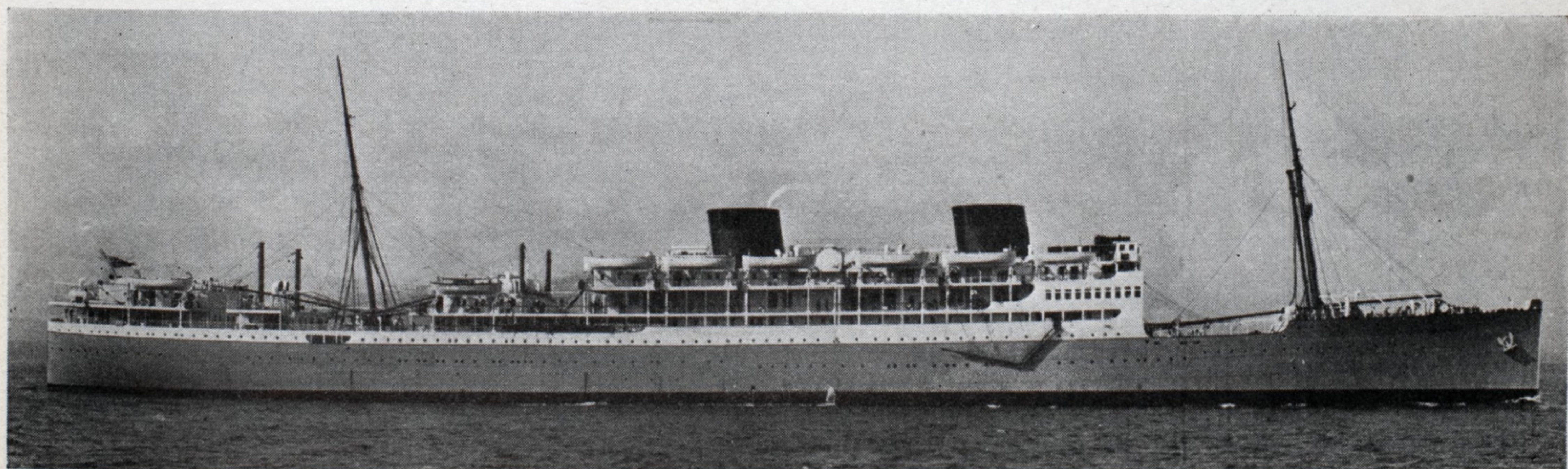
The Canadian government has awarded to Davie Shipbuilding & Repairing Co., subsidiary of Canada Steamship lines, Ltd., contract for construction of two tugs, to cost \$300,000, and an additional contract of \$30,000 for unspecified work to relieve unemployment.

## Germany Plans Huge Fleet

A five-year plan for the construction of 500,000 tons of new ships by the North German Lloyd Co., was revealed by Senator Boehmers a director, in a speech at a People's Party meeting in Bremen Nov. 26.

The company intends to obtain the necessary capital abroad Senator Boehmers said. The project will create employment for 27,000 men.

Shipping circles presumed that the scheme was connected with the joint program of the North German Lloyd and Hamburg-American lines for the scrapping of 600,000 tons of antiquated ships.



*Twin Screw British Motorship Winchester Castle on Trial Trip—Total Horsepower, 13,800 at 98 R.P.M.*



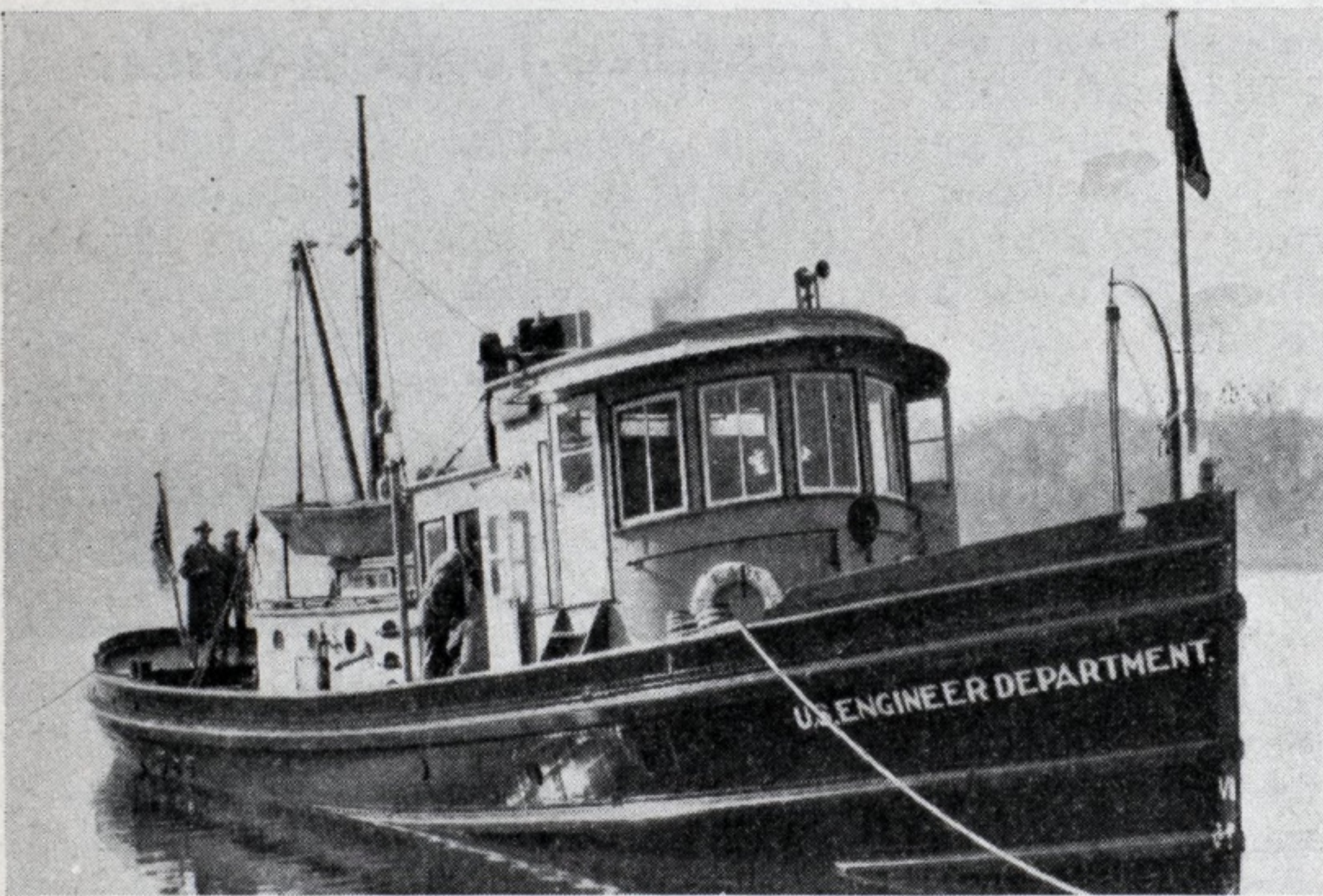
## Terminal and Harbor Tug Built by River Yard

Marietta Mfg. Co. of Point Pleasant, W. Va., has just delivered the tug EADS to the United States engineer office, first district, New Orleans, La. The EADS is a single screw, diesel powered tug with a hull size 65 feet, 6 inches long x 17 feet, 7½ inches beam and will be used for terminal and harbor work. It is powered with a 225 brake horsepower Winton marine diesel engine.

The auxiliaries consist of a combination bilge pump and compressor, manufactured by the Winton Engine Co.; fire and bilge pump, manufactured by the Goulds Pump Co.; and a Kohler automatic generating plant.

While this is a terminal and harbor tug, provision has been made for accommodation of a crew of six men, having complete galley and mess outfits, berths, and a steam heating system.

The EADS is equipped with a derrick



and winch capable of handling 1500 pounds. The derrick has a mast 22 feet long and a boom of 13 feet, 6 inches. The winch is of the double gear type.

There are two fuel oil storage tanks of 500 gallons capacity each, located in the hold.

The EADS was designed by the marine design division of the United States engineer department under the direction of C. H. Giroux in the Washington, D. C. office.

## Build All-Welded Tanker

An all-welded steel diesel electric tanker will be built at the works of the Sun Shipbuilding corporation at Chester, Pa., for the Atlantic Refining company, according to an announcement made recently.

The new boat, 200 feet in length will have a beam of 34 feet, a molded depth of 12 feet and will carry three 120 horsepower Cooper-Bessemer diesel engines operating on a trio of electric generators. In addition, a

main propulsion motor of 400 horsepower will be carried.

The tanker will be the thirteenth of her type in this country, although her predecessors were built with conventional riveted hulls. The triple motors and generators are so arranged that any two may be used while the tanker is under way and the third may remain idle for reserve power.

The tanker will have a capacity of 7000 gallons and will be ready for delivery early next summer.

## Gyroscope for Yacht

One of the largest gyroscopes ever constructed for a private yacht has just been shipped from the Westinghouse plant at South Philadelphia to Bath, Me., where it will be installed in the new 279-foot yacht CAROLINE, now under construction for Eldridge R. Johnson, of Camden, N. J.

The giant instrument tested under the supervision of engineers from the

*The Diesel Powered Tug Eads Recently Delivered to the United States Engineer's Office at New Orleans. This Vessel Was Built by the Marietta Mfg. Co.*

naval architect's firm of Henry J. Gielow, Inc., measures eleven feet in diameter over all and weighs 105,000 pounds complete. The wheel within the gyroscope weighs 88,000 pounds and will be turned at a maximum speed of 1300 revolutions a minute.

A 210-horsepower diesel electric motor will be used to spin the wheel and it will take the power unit one and one-half hours to raise the revolution counter to its maximum. Once the gyroscope is in place it will have a roll-quenching factor of five and one-half degrees and will hold the yacht within two degrees of a roll from the vertical.

A section of the yacht's hull has been left unplated for the installation of the gyroscope and a pair of 1500 horsepower Cooper-Bessemer diesel engines. The three units and their auxiliaries will weigh approximately 400,000 pounds.

The Edward E. Gillen Co., Milwaukee, on Dec. 15 moved to its new offices at 727 Milwaukee Gas Light Co. building.

## S. S. President Hoover

(Continued from Page 25)

latter was started from aft coincident with the last rally on the wedges. Removal of the collapsible blocks followed and the sand blocks were the last to be released.

The vessel when launched was in a fairly advanced state, particularly in the matter of propulsive machinery and deck auxiliaries. The boilers were installed, and the main motors with all shafting and propellers were in place. All boiler and engine room auxiliaries, and the refrigerating machinery were also installed.

The principal items of launching data are as follows:

### Principal Launching Data

Inclination of keel per foot .....	1½ inch
Inclination of groundways per foot.....	5⁄8 inch
Transverse inclination of groundways per foot .....	3⁄8 inch
Total length of groundways .....	770 feet
Width of groundways .....	84 inches
Distance between ribbands, forward....	30 feet 1 inch
Distance between ribbands, aft.....	30 feet 6 inches
Length of sliding ways.....	560 feet
Width of sliding ways .....	72 inches
Bearing surface, square feet.....	6720
Width of packing .....	60 inches
Total launching weight, tons.....	about 13,500
Unit pressure, tons per sq. ft.....	about 2
Maximum pivoting pressure, tons.....	1600
Distance slid to pivoting .....	460

The general design of these vessels was prepared by the Newport News Shipbuilding & Dry Dock Co. under the supervision of Carl E. Petersen of that company, who worked in conjunction with the directors and operating officials of the Dollar Steamship lines at San Francisco to obtain vessels best meeting the service requirements of the trade. Detailed plans were developed with the co-operation of the owners and the important task connected with the final development and working out of the design was under the immediate direction of H. F. Norton, naval architect and J. F. Nichols, chief engineer of the Newport News Shipbuilding & Dry Dock Co.

The interior architecture and decoration of the public spaces of these vessels have been designed by A. F. Marten & Co. of San Francisco, who will also supply the furniture and furnishings.

## Repairs on Warships

Expenditure of a sum not to exceed \$30,000,000 for alterations and repairs on three naval vessels is authorized in a bill which was approved by the senate committee on naval affairs Dec. 4. The vessels are the NEW MEXICO the MISSISSIPPI and the IDAHO. The bill provides that the alterations are to be subject to limitations prescribed in the treaty limiting naval armaments, ratified Aug. 17, 1923.



## Old Puget Sound Service Is Forced to Withdraw

Competition of busses and automobiles has at last driven off steamship service between Seattle and Tacoma, a distance of 26 miles. The Puget Sound Navigation Co., which has maintained this service for about 25 years on Dec. 15 withdrew its steamers TACOMA and INDIANAPOLIS. Water service between the two cities has been operated for 48 years. Until 15 years ago this route was one of the most profitable on the Pacific coast but the increasing use of private automobiles and construction of good roads, making fast bus service possible, has rendered the water service unprofitable. For many years the wood steamer FLYER, famous for her long and successful career, operated between the two ports. Twenty-five years ago the Puget Sound Navigation Co. brought out the steamers INDIANAPOLIS, CHIPPEWA and IROQUOIS from the Great Lakes for Puget Sound service. The former steamer, built at Toledo in 1904, has since been

continuously operated on the route. The CHIPPEWA and IROQUOIS have been remodeled into automobile ferries. The TACOMA, a fast steamer capable of making 17 knots, was built especially for the run at Seattle in 1913 and has operated without interruption since that time.

## Terminal Lease Renewed

Renewal of its lease of the shipping board terminal at Charleston, S. C., to the Port Utilities commission of Charleston was approved by the board on Dec. 3. The new lease is for a period of five years from Feb. 28, 1931, and its terms embrace a profit-sharing arrangement under which two-thirds of the earnings, over and above a minimum percentage of sums expended by the board for improving the property, will be paid to the board.

A similar lease with the port utilities commission has been in effect since Feb. 17, 1926, and operations during the period have resulted in steady increases in revenue to the United States shipping board.

## To Construct Railway Dry Docks for Ostend

The Belgian government recently engaged the Crandall Engineering Co., Boston, to design and construct two railway dry docks for the new fishing port at Ostend. Ostend is the principal fishing port of Belgium. Its fleet of trawlers, nearly all diesel driven, is constantly growing and these railway dry docks are needed to meet the increasing demand for dry docking facilities. It is expected that they will be ready for operation in September, 1931.

On Nov. 10 the city of Sandusky, O., voted to engage MacElwee & Crandall, Inc., consulting engineers, Cambridge, Mass., to make a thorough study of the existing port facilities, the relation of these to present and future industry, and to prepare a report upon a comprehensive plan for the logical future development of the port. This same firm is now engaged on a similar investigation for Green Bay, Wis., an active port of the upper lakes.

# New Diesel Lighter Has Unique Steering Gear

THE New York Central No. 35, a diesel covered lighter, has been turned over to the New York Central railroad by its builders, United Dry Docks, Inc. The lighter is powered with an Ingersoll-Rand 600 horsepower marine diesel engine, designed to operate at 240 revolutions per minute. On its trials the Number 35 attained better than 13 miles per hour at 204 revolutions.

Built of steel, with the super structure of wood reinforced by steel, the lighter is 122 feet long, 32.6 feet beam and 14 feet deep. It is in service as the seventh unit of the New York Central's fleet of fast mail and freight boats operating between ship and shore. Cargo is carried on the main deck under a deckhouse that

extends almost the full length of the ship and provides space for about 80 tons of general cargo daily, as against 60 tons for steam lighters.

A unique feature of the lighter is its steering gear, which has been named the Unidock ram steering engine. It is an adaptation of the steam ram type designed several years ago by United's Staten Island plant and now is in general use on New York harbor craft.

The new engine is of the electric hydraulic type and consists of a cylinder and piston operated by hydraulic pressure. The pressure is applied through the medium of oil admitted to either side of the piston by a piston valve operated by drum and wire rope from the pilot house,

and equipped with a follow-up gear attached to the crosshead. The oil is kept at practically constant pressure by an electrically driven pump, running at constant speed, and which delivers through a pressure tank to the valve chest on the engine, with a relief valve in the line through which the surplus oil is delivered to the supply tank.

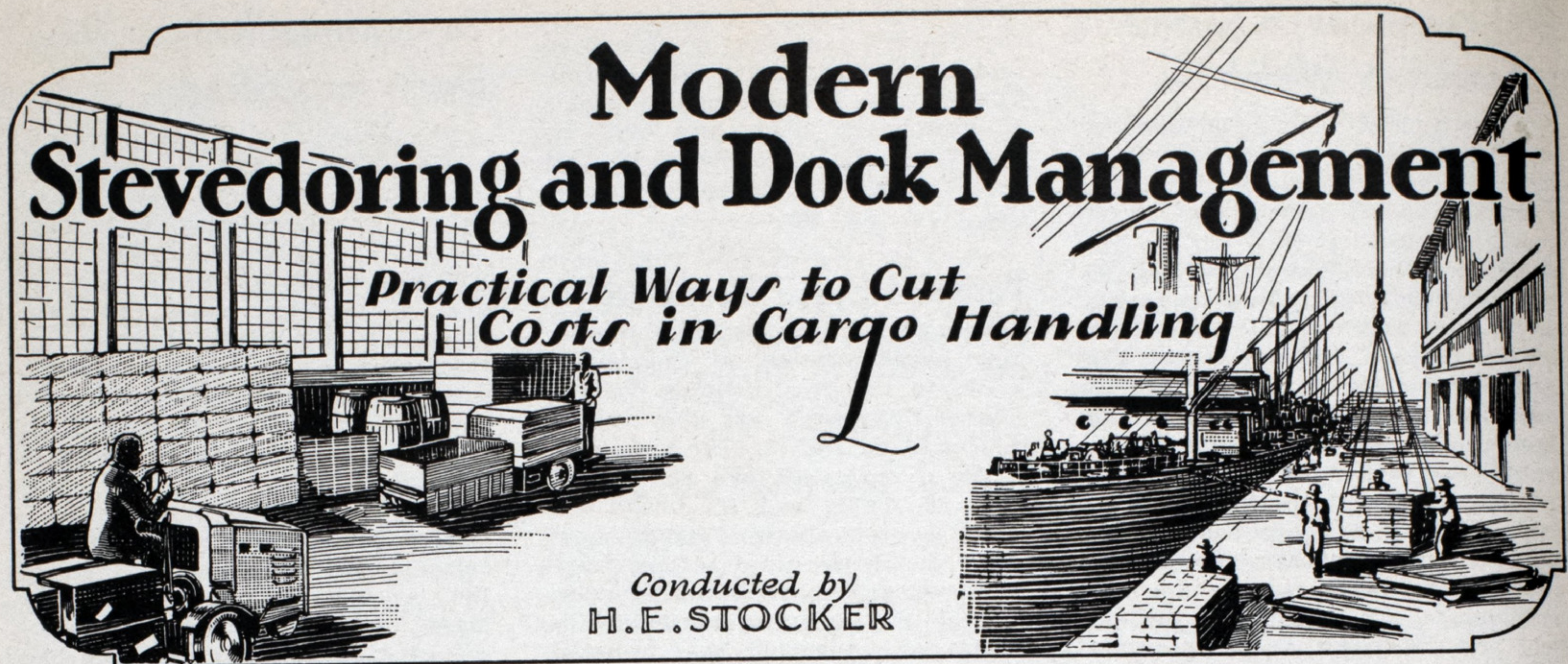
The pressure tank is kept about one-half full of air at working pressure, to form an air cushion and reduce fluctuations in pressure when the engine is in operation.

Oil discharged from the engine is led to a supply tank with a capacity sufficient to hold all the oil in the system. The pump takes its suction from this tank.



*Diesel Covered Lighter New York Central No. 35 built by United Dry Docks Inc. for New York Central Railroad*





# Modern Stevedoring and Dock Management

*Practical Ways to Cut Costs in Cargo Handling*

Conducted by  
H.E. STOCKER

## Claim Prevention Department Shows New Way to Greater Profits

By R. Bruce Miller

ONE of the duties of the department of claim prevention would be the study of commodity characteristics and the filing and use of this information to provide correct stowage and handling. This is necessarily done at present but few steamship companies have developed this information and the application of it to the fullest practical extent.

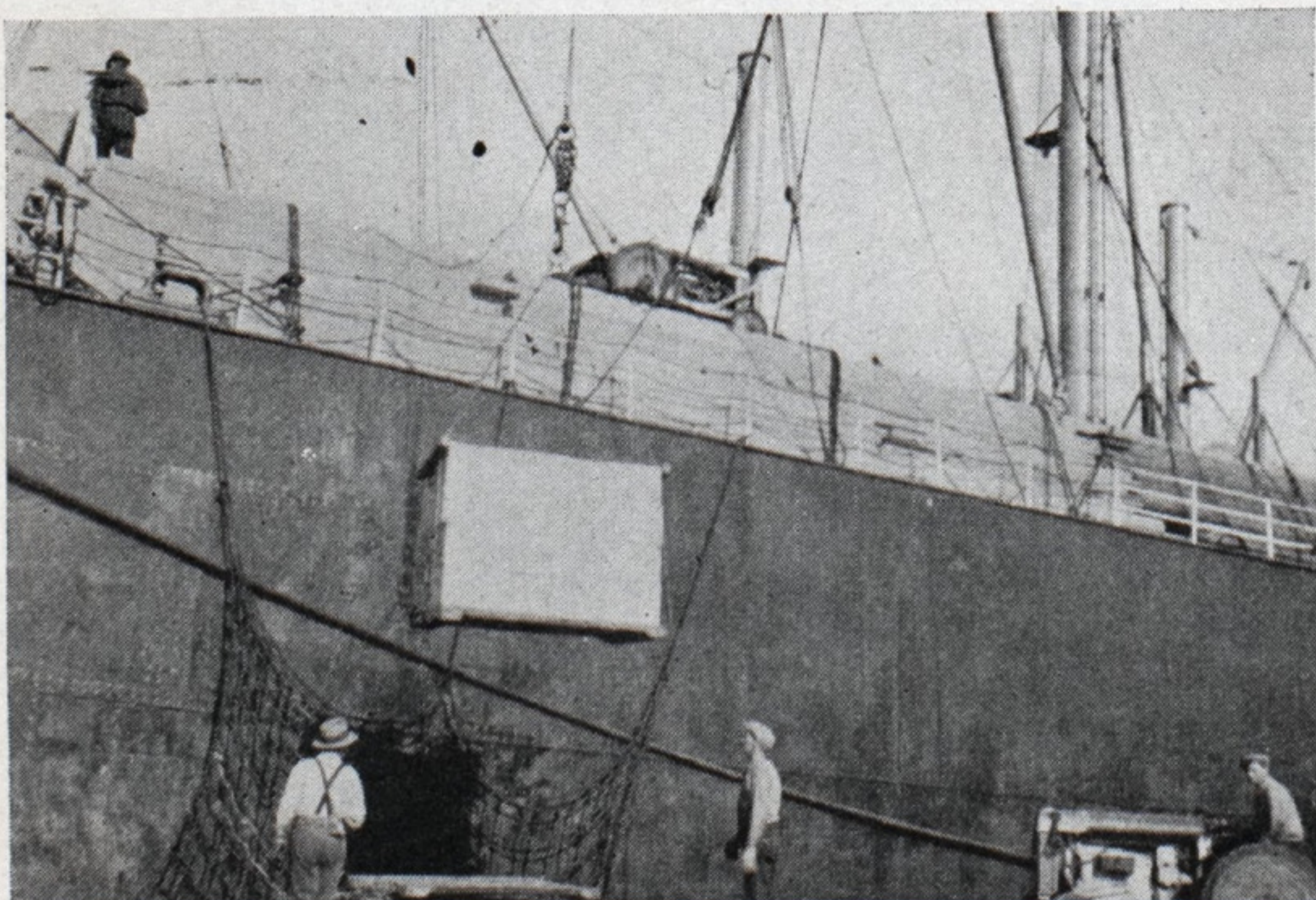
Each company should keep careful records of claims made by consignees and should analyze these according to types of loss or damage, probable cause or causes of loss, where loss or damage probably occurred, nature of commodity, etc. The types of loss or damage are roughly as follows: theft and pilferage; non-delivery; ullage; leakage; loss of weight; heat; sweat; mold; ship sweat; fresh water; sea

water; contact with other cargo; contamination; taint; vermin; fuel oil; breakage; crushing; chafing; hook damage.

These losses may be caused by any one or a combination of the following improper or inadequate checking; protection; handling; stowage; design of gear; ship design; ship operation and maintenance; improper packing. The human element, the inherent susceptibility of a commodity to damage and perils of the sea are of course contributory factors and should be noted and gaged but they can not be prevented and are seldom the sole cause of damage. The known fragility of eggs, plate glass and X-ray tubes for example should simply point out the necessity for special care in handling, stowage, etc.

I have briefly indicated some elements of loss analysis. In order to make this analysis, however, it is essential that the information on which the analysis is based be accurate and complete. This requires not only careful inspection and supervision from the time shipments are received until they are delivered but also an intelligent and complete survey report. Some one with a knowledge of the correct principles of case and crate design should make a brief inspection of all cases received and report all flagrant instances of improper packing. Checkers should note the details of any cases received in apparent bad order. Handling on the dock should be under constant supervision and any damage occurring on the dock reported immediately. All containers to be recoopered should be examined and details noted before recoopering. Loading and discharge operations should be observed carefully and damage occurring in these operations inspected and reported. Similar supervision should be exercised in the holds to note cargo damage during stowage or there detected and likewise during breaking out of cargo. More damage undoubtedly occurs in breaking out of cargo than in stowage and difficulty in breaking out cargo should be reported as this can often be prevented by changing the method of stowage or using more or different dunnage.

The supervision noted above need not require a large staff of trained



*A Neat and Secure Draft Obtained by a Little Care in Stacking and in Adjustment of Spreaders*



experts as it is largely a question of having a competent man with authority and ability to train the present personnel what to observe during their normal duties and require them to report their observations.

In addition to the above reports, the head of a claim prevention department should have reports from the ships officers as to any incidents of the voyage which might contribute to cargo damage and the condition of top cargo and cargo space when hatches are removed. In other words the report should sum up what might be drawn from a detailed inspection of the log and should correlate conditions during the voyage with the hatch survey. The department head should also have such special reports from officers as may be required in any unusual studies, such as that of ventilation for the prevention of sweat, humidity control in ships refrigeration, etc.

Constant supervision of shipments is almost an end in itself as, quite aside from enabling proper reports and analyses of damage to be made, the observation will usually suggest ways and means of preventing such damage to the person who reports it and is on the ground to prevent it. However, reports having been made and analyzed, corrective measures should be instigated by the head of the department. This is where imagination, technical knowledge, resourcefulness and leadership must come strongly into play in order to overcome habit, prejudice and inertia. Division of responsibility and the peculiar organization of receiving, handling and stowage of cargo, together with the limitation of personnel and labor conditions are such as to make certain corrective measures exceedingly difficult. I believe this can be accomplished by giving the other fellow credit and letting him think he did it as well as the general use of judgment and tact. Good work should be rewarded to the fullest possible extent and bonus systems used wherever thoroughly practicable. It is obvious that the cooperation of clerks, dock laborers, stevedores, longshoremen, ships officers and crew must all be enlisted in the prevention of loss and damage.

There is another phase of loss prevention work which is very important and has been almost totally neglected by steamship companies but can be used to obtain much good will from shippers if properly employed. This phase is the establishment of an advisory service for the shippers benefit which would consist of information as to correct packing for export in all its manifestations. It could also be extended to include information regarding transportation facilities in the countries to which cargo is consigned and customs regulations in regard to packing and marking of cases which if not followed would sub-

*These Large Bags of Wool are Sunburned and Weakened so They Must Be Handled on Trays. Ordinary Rope Slings Should Never Be Used for Sunburned Bags*



ject the shipment to delay and the consignee to a fine or extra tariff charges.

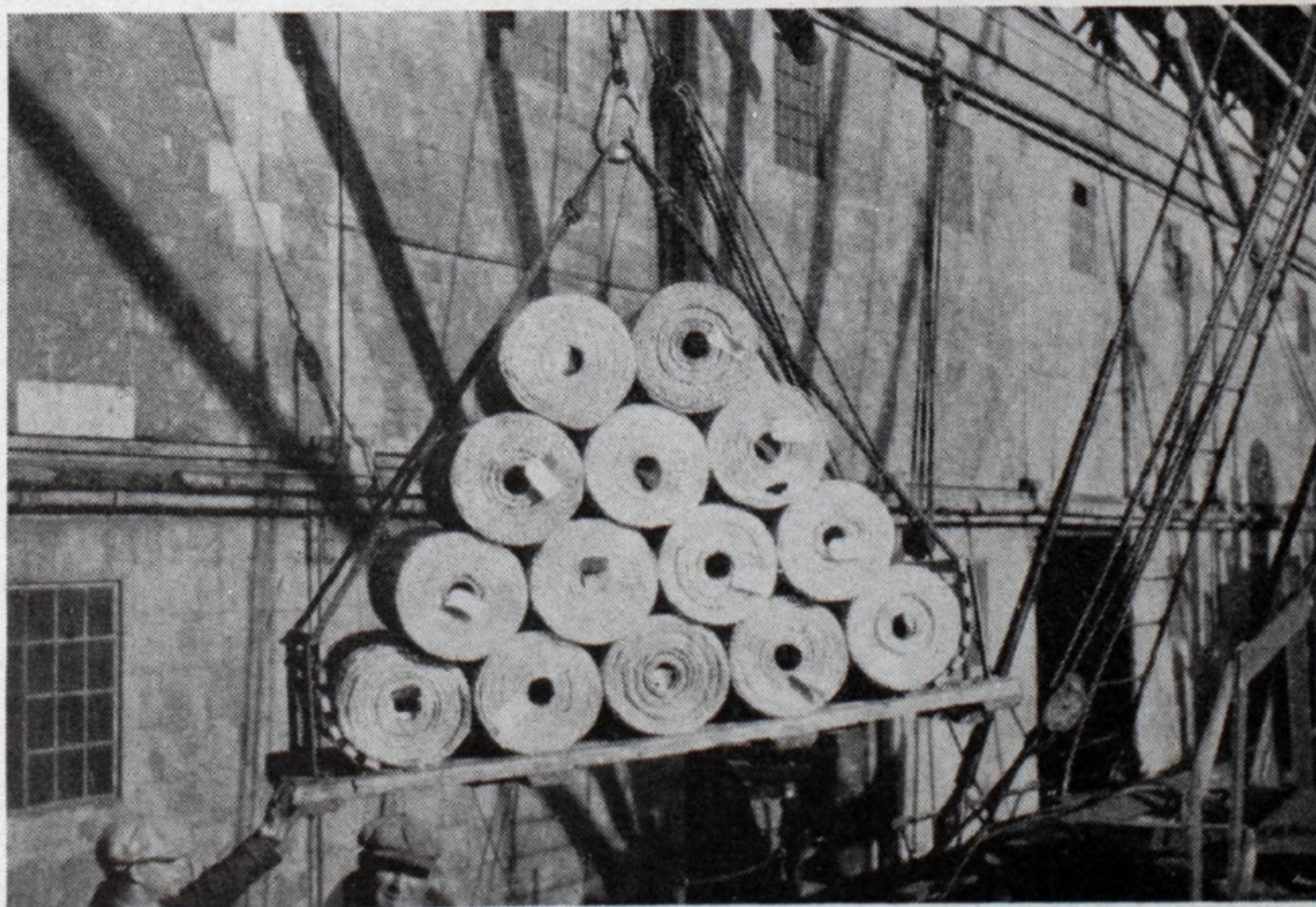
It may be thought that shippers would resent suggestions for packing improvement and steamship companies may state that this has been their experience where they have made rules or rejected poorly packed cases but I think the trouble in such cases has been that rules or requests have been unreasonable and the companies have poorly prepared and presented their cases. For example, one conference attempted to ban veneer cases. No distinction was made between poorly designed three-ply cases and well designed five-ply cases whereas one is a very poor case and the other a very good one. Although there is more than twenty variations of the veneer case, no distinction was drawn. Restriction of cartons has also been enacted but savings in the use of cartons are so great that steamship companies would do well to demand good cartons properly marked and sealed and then make special provision for care in handling and stowage. There are good and bad cartons as well as cases and the export carriers should see the trend of the times and profit by the experience of intercoastal carriers who have learned how to care for carton shipments.

The best proof that packing advice works and is welcomed by shippers is to be found in the success of the freight container bureau of the Ameri-

can Railway association. The engineers of this bureau have made thorough investigations and have been sure of their ground before making recommendations. Their recommendations have been carried out by shippers, losses have been reduced and and the railroad companies have been rewarded by increased good will. It is a fact that all reputable concerns wish their shipments to arrive in good condition and they regard sound outturn as of great importance in securing repeat orders. The farther away the customer, the more difficult is the replacement of damaged merchandise or broken parts and a good export manager will listen to sound advice for packing improvement. This has been further demonstrated by one of the oldest and largest American marine insurance companies which has maintained a service bureau to specialize on packing advice among other loss prevention activities and has been successful in improving the packing of its assureds' merchandise, thereby securing prestige and favor.

The service bureau of a steamship company in its advisory capacity could subtly draw attention to the special care and handling employed by the company and do much to create favorable publicity. This publicity, supported by real performance which would be proved by the loss record and insurance rates, would aid in the defeat of competition offering equal or lower freight rates but outturning

*An Exceptionally Well Designed Tray for Rolled Wire Netting. No Denting and Kinking is Possible*







*Tween Deck Stowage. Sturdy Packages of Sandpaper Make Up Lower Tiers. Flooring of Dunnage Under and Over Barrels of Glassware. Cartons of Glassware Are on Top*

cargo in a less satisfactory condition.

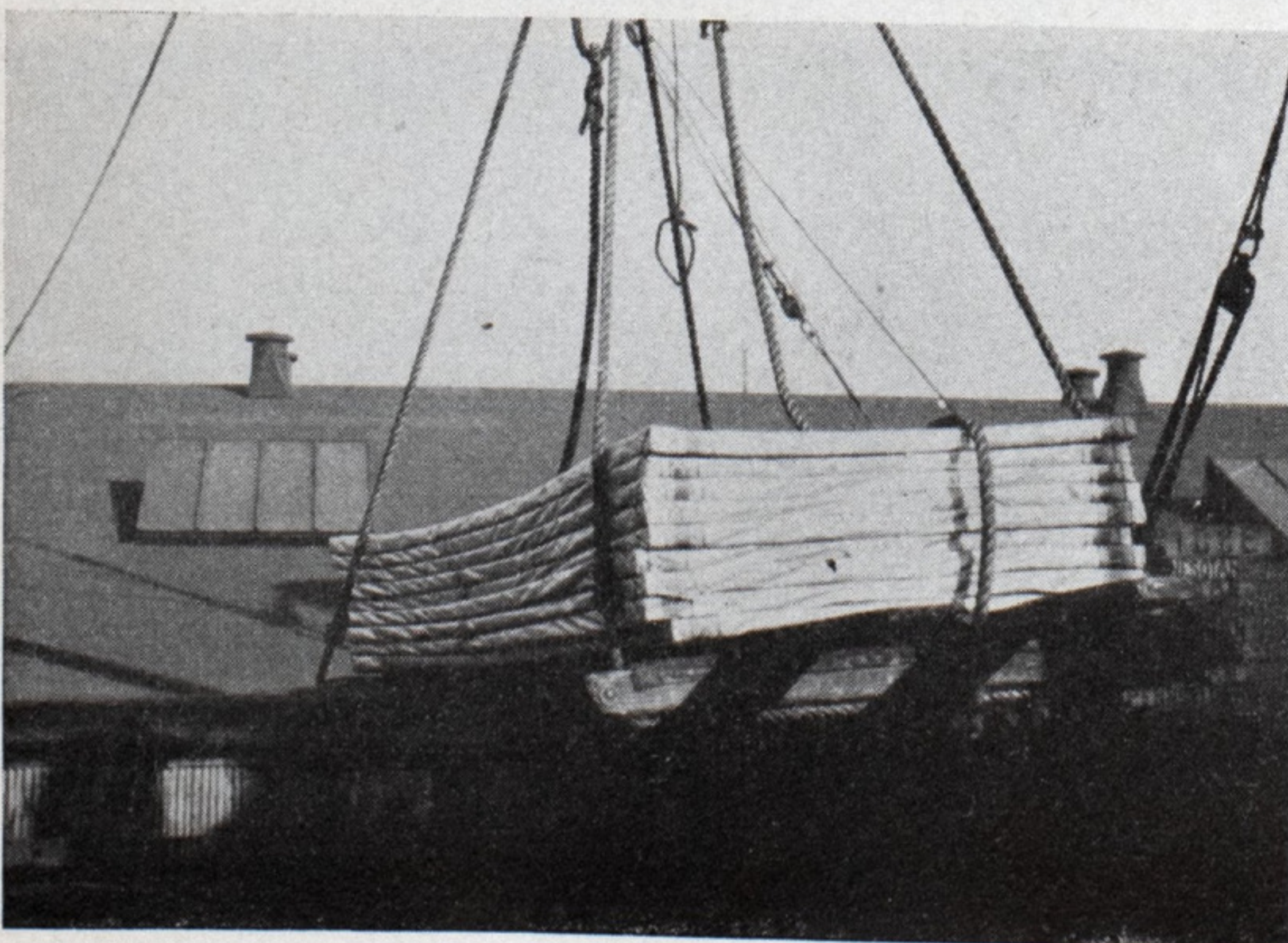
It should be realized that insurance companies keep detailed statistics classifying losses by steamer lines and can and do exert an influence toward the carriage of cargo by the lines that have most satisfactory loss records. It should be part of the duty of the loss prevention department to keep a record of the reduction of claims and bring this record to the attention of marine insurance companies in order to be sure that the line will receive the fullest benefit from the influence that insurance companies can exert by rate or otherwise. A more rational attitude toward insurance companies than commonly exists would in my opinion be a distinct advantage to the operators of steamship lines.

Theft and pilferage is a very serious problem that all steamship companies must face. I have had considerable experience in studying this type of loss in New York where the extent of theft from docks, lighters and ships has been estimated as in excess of a million dollars annually. I believe that a considerable amount of pilferage occurs during the trucking but even in this case the steamship companies can help to run down the responsible party by checking the time of receipt or delivery, recording names of the drivers and trucking

concerns employed and comparing notes in all cases where concealed pilferage is reported to determine how frequently the same drivers are involved. Where suspicion rests heavily on a certain driver or concern, as a result of these records, special attention can be given to the checking of his movements and the condition of cases handled by him.

In regard to the steps that can be taken to prevent pilferage of cases while in the custody of the steamship company, the following might be considered:

- A. More careful selection of watchmen, accompanied by increased pay. Watchmen are too frequently aged, inactive and unobservant. Watchmen should be discouraged from fraternizing with other employees. This also applies to checkers and dock clerks.
- B. Dock congestion should be prevented by utmost co-operation with the traffic managers of shippers or consignees in order to control the delivery of cases to and from docks so that they will be on the dock at risk of theft for the shortest possible time. Concerns not taking prompt delivery of cases should be reasoned with and penalized in extreme cases.
- C. Cribs should be erected for the special protection of valuable cargo and very small packages



*Special Cushioned Platform Sling for Flat Bundled Paper. In This Way There Is No Pressure on Edge of Bundles*

and for commodities of moderate value which are for one reason or another experiencing unusual pilferage. Cases should be checked in and out of crib. Special cargo space should similarly be provided on ship board and cargo checked in and out by responsible officers having sole access to this space.

- D. Valuable cases should be weighed both when received and delivered and examined carefully. Similar treatment should be accorded any commodity suffering a heavy run of losses. One of the largest steamship companies has used this system of determining where clever pilferage was constantly occurring and by so doing not only proved that it did not occur while the cases were in its custody but definitely determined where the theft must have occurred. This led to the detection of the thieves and largely put an end to the heavy pilferage losses in the trade concerned.
- E. Broken or suspicious cases should be called to the immediate attention of shipper or consignee and inspected and recoopered with despatch. These cases should be kept in the special cargo crib pending acceptance or delivery.
- F. The use of second-hand cases should be discouraged by every means possible and shippers should be encouraged to protect their cases by strong construction and the use of anti-pilferage devices properly applied.
- G. Good lighting facilities should be employed. The railroad freight terminals cut down theft, damage and accident claims to a marked degree by adequate flood lights. It is a demonstrated fact that thieves work more safely and take more kindly to the dark than to the light.
- H. Theft in holds during loading and discharge should be prevented by keeping the gangs busy and by constant supervision. Selection of gang foremen is important in this respect.

The purpose of my discussion as a whole has been to demonstrate the need of a competent and separate department to study losses, plan loss prevention and coordinate the efforts of all parties concerned in the custody and handling of cargo. It is noteworthy that the British "carriage of goods by sea act" of 1924 provides that a ship owner shall "Properly and carefully load, handle, stow, carry, keep, care for and discharge the goods carried."

The best interests of a ship owner are served by providing the best possible protection of his shippers' interests and only by protecting these interests can the ship owner expect to hold and increase his patronage and maintain earnings with full cargoes at fair rates.



# Mutual Protection Provided for Waterfront Employees

By Robert C. Hill

**M**UTUAL protection at lowered rates was the primary purpose of the Stevedores' Self Insurance pool, organized in 1929 by a number of employers in the State of Washington. The first annual report of this organization shows that what began as an experiment has proved a decided success. Not only have the costs been reduced but improved relations with the men have been established.

The plan of the Washington stevedores is unique but its fame has spread to many ports which are desirous of following suit. Inquiries have been received from New York, Boston, Baltimore, Gulf ports and the principal ports in California and Oregon. Lloyds, London, is also interested judging by a recent communication which asks for details of the pool. No immediate expansion is planned by the local sponsors of the pool except that it is intended to cover the ports of the Columbia river during the coming year.

The Stevedores' Self Insurance pool maintains headquarters at 719 Second avenue, Seattle. D. K. MacDonald, a widely known insurance expert, is trustee. Frank P. Foisie is supervisor of claims, and Frank K. Hitching, of wide shipping experience, is manager of the pool office.

## Started as Experiment

Mutual insurance for the stevedoring industry is in line with the joint shop plan of employment, which originated in Seattle and has brought peace and order to the Seattle waterfront. This plan has been adopted in some other ports, either in whole or in part. Premium rates for covering stevedoring hazards have always been high for it is a dangerous occupation. Past experiences had not always been satisfactory either for the employers or for the men, who naturally have always held the insurance adjuster in open suspicion.

When the pooling of insurance was proposed there were many doubters but it was decided to try the experiment. It has been more successful than expected and its sponsors are extremely gratified over the first year's showing. Briefly, the operations of the first twelve months show that a substantial saving in premiums has been effected, the cost being less than two-thirds that of insuring with private companies while results have been satisfactory to everyone. Close contact with the injured man and his

family have brought about more cordial relations. Particular pains are taken to insure the victim of an accident prompt adjustment of his claim and regular payments due him. The manager frequently calls on the disabled workman and he is treated with sympathetic consideration, everything possible being done for his welfare. Consequently the former hostile attitude of the men towards adjusters and the insurance companies has been removed. Under present conditions injured longshoremen know that they will be given a square deal and in some instances, to their surprise, they have received more compensation than they thought was due them.

Close co-operation is maintained with the officials of the United States employees' compensation act with the view of giving the worker all that the law allows to the end that he may be back on the job as soon as possible.

Between 400 and 500 claims were adjusted, both for death and injury, by the Stevedores' Self Insurance pool during the year. In all cases where there was a dispute, settlement has been reached without resorting to litigation.

The pool began operations July 1, 1929. As their first contribution the member stevedores each paid into the fund one-twelfth of their annual payrolls. In subsequent months payments have been based on a percentage of each member's payroll, as follows:

For compensation insurance; per \$100 of payroll .....	\$9.35
For vessel liability; per \$100 of payroll .....	1.50
For reinsurance (in excess of \$5000) of payroll .....	.90
For public liability per \$100 of payroll .....	.30
Total premium cost .....	\$12.05

This rate shows a substantial saving compared with the cost of insurance previously. The former rate totaled \$18.82 per \$100 of payroll of which compensation alone cost \$14.70. The pool's annual report indicates that the actual cost of insurance during the first year's operations was approximately \$8 per \$100, which is only two-thirds of the money paid in, thus allowing a very satisfactory reserve and balance after the payment of all claims and operating expenses.

Marked savings have also been effected in operating costs. Overhead of liability and ordinary insurances companies average, it is said, about

40 per cent of income. The Self Insurance pool, under its by-laws, is limited to a total outlay of 15 per cent of which 10 per cent is allocated to operating disbursements and 5 per cent is paid to the trustee officer.

The success of the pool plan is involved in adequate reinsurance for without this protection, the resources of a small group might easily be wiped out by one serious mishap causing several deaths and the injury to a large number. The pooling arrangement protects members for individual claims not exceeding \$5000 each. Losses greater than this sum are covered by reinsurance to a maximum of \$500,000 placed with one of the most reliable companies in the country. Reinsurance also covers the pool's losses up to \$500,000 if they exceed 90 per cent of income. This feature gives the members of the pool not only full coverage but also security in the event of an unusually serious accident. The first twelve months show that the pool's losses reached a ratio of only 60 per cent. There were no losses under vessel and public liability and the reinsurance company paid only one claim. Consequently the reinsurance company also enjoyed a profitable business in its pool risk.

There are stevedoring companies in this state which have worked on the plan of carrying their own insurance but it is claimed their operating costs are higher than those of the pool. The success of the latter organization has been so marked that additional memberships are promised as soon as some pending insurance contracts expire. Sponsors of the pool are well satisfied with the figures covering the first year's business. They believe they have solved a problem that has perplexed the industry for a long time. Not the least important achievement, in their opinion, in addition to reduced premiums, is the fact that improved relations with the working man have been established, for sympathy and justice towards the worker is bringing dividends in the form of confidence and loyalty.

## Club Rooms Maintained for Ship Officers and Crews

**U**NIQUE in dock management is the service furnished by the East Waterway Dock & Warehouse Co., Seattle, which has fitted up comfortable and attractive club rooms for the use of ships' officers and crews. These accommodations are greatly appreciated and have brought the Seattle terminal favorable comment from many other quarters. Masters and seafaring men who have enjoyed the hospitality of the local dock company have broadcast the fact that here they were given courteous consideration.

The club rooms are installed in the



warehouse adjacent to the ship's berth. They consist of several large rooms completely furnished with every necessary convenience. The rugs, furniture and appurtenances, including victrola and radio, are equal to those to be found in any well appointed hotel. There are card tables, a buffet, writing tables, stationery, books, charts, magazines and every other facility so that a ship master and his officers may do their work in the club rooms or enjoy the recreational features offered which are the idea of Manager H. W. Hall.

#### Completely Furnished Kitchen

In an adjoining room is a completely furnished kitchen where meals are served when necessary. Upon the arrival of every ship, tea and confections are served, thus greeting the stranger with a delightful hospitality so common in foreign countries. The entire ship's personnel is made to feel at home and they are urged to make full use of the terminal's social facilities. A steward is employed to care for the quarters and wait on guests.

Quarters for the men are not so elaborately furnished but are clean and comfortable equal to any f'castle afloat. There are steel bunks where seamen may bring their blankets and spend the night if necessary.

It is frequently the case that ships are fumigated while lying at this terminal. This procedure makes it necessary for the entire personnel to go ashore for eight to twelve hours. In such event the club quarters are found most useful and much appreciated.

Masters and crew are always pleased to return to the East Waterway dock for they are assured of a warm welcome and personal service, in addition to prompt dispatch.

## Discussions of Paper Given Before Naval Architects

By Capt. Kristen Tvede

The paper on "*Ship Design from the Operator's Point of View with Particular Reference to Cargo Handling and Stowage*," presented before the last annual meeting of the Society of Naval Architects and Marine Engineers, points to the benefits obtainable and the greater returns that can be had on the investment if cargo handling features of a ship be given proper consideration. The importance of modern cargo handling equipment cannot be overestimated.

One phase of the operation in the handling of cargo has not been mentioned and that is the transportation of the cargo from the square of the hatch where the sling is made to swing and abruptly landed as far under the deck as possible from the cargo fall, to the place of stowage. From there the cargo is either handled by hand, that is, carried, or it is placed on rollers or on trucks, all of which is a cause of damage to cargo and is an unnecessary extra handling. From my experience at least 30 per cent of the damage to cargo is done when landing the sling-load in the ship and when transporting it to the place of stowage. This could be eliminated if some system of mono-rail or overhead transportation were arranged for under the decks from the hatch coamings to the shipside and bulkheads.

There is another point I wish to call attention to. Why install cargo lifting gear on ships built for certain trades? Why not install the gear on the docks? This idea is not a new one. It has been advocated for years by Mr. Hinchcliffe of the

Ellerman Wilson line and by others. When one considers that the ship's gear is idle about 60 per cent to 70 per cent of the year a way ought to be found to eliminate this costly waste. To have an investment, represented in the cargo gear, lying idle about 60 to 70 per cent of the year is a waste which probably no business man but the good natured shipowner would stand for. The proper handling of general cargo is an engineering problem and must be solved as such. We are called upon today to transport general cargo packed in containers that ten to fifteen years ago would have been thought impossible and we are handling that cargo with practically the same gear.

Another feature is ventilation. Practically every ship afloat today can ventilate the cargo holds only in good weather. What would be said of a warehouse on land that could not be ventilated at all times?

## Discussions Continued

By Elwell Parker Electric Co.

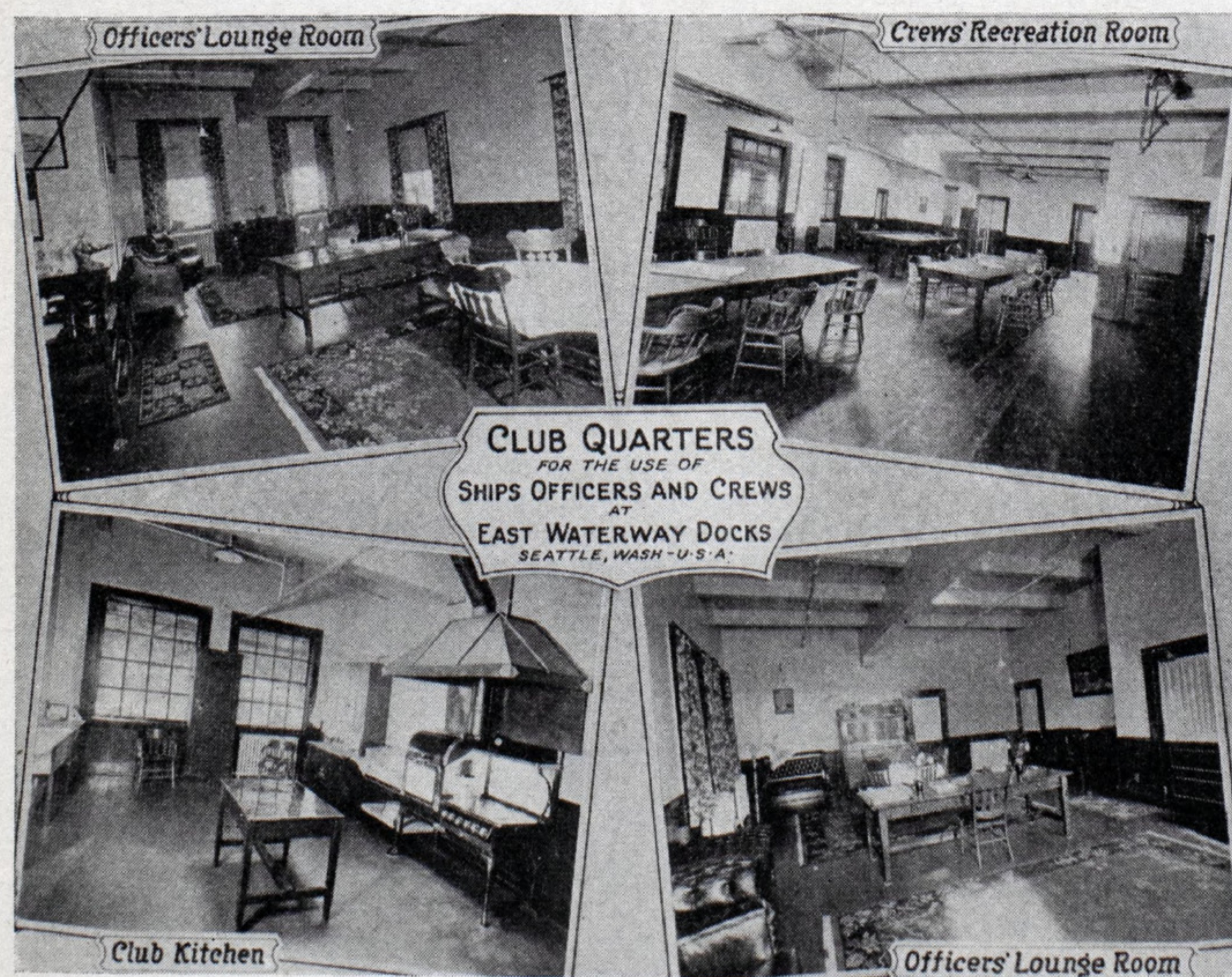
After carefully reading the paper on "*Ship Design from the Operator's Point of View with Particular Reference to Cargo Handling and Stowage*," presented after the last annual meeting of the Society of Naval Architects and Marine Engineers, we extend our congratulations to the authors for the clear and concise way they have handled this important subject.

The subject has been well covered in this paper. We agree with the points raised, especially under the heading of side ports with reference particularly to the elimination of coamings and lapped plates, proper width and height of side ports and location of stanchions and ventilation trunks to offer least possible interference to the free movement of mechanical handling equipment.

Elevators in ships or those used along stringpiece of dock should have sufficient capacity to take lift trucks to avoid rehandling of cargo.

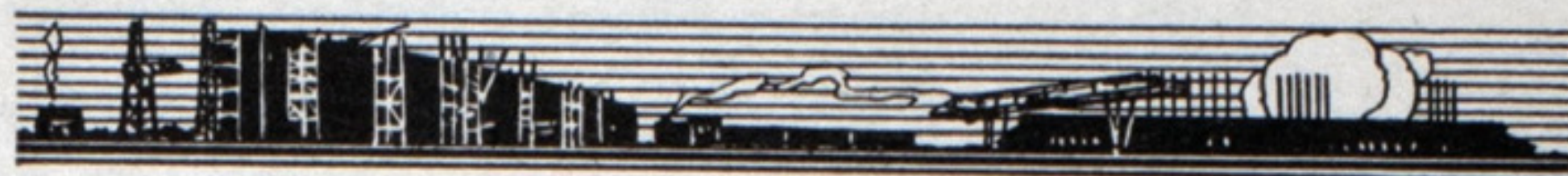
Careful consideration should be given also to the location of side ports in relation to hatches, i. e., the aisle space between hatch and side port should be sufficient to insure economical handling. Before the ultimate can be reached in economical cargo handling full consideration must be given to proper correlation of ships and terminals particularly the alignment of side ports with pier openings. Our experience has been that we are able to deliver cargo alongside ship at considerable savings but that these savings are almost immediately overcome by the inability of the gangs in the ship to continue the flow of cargo.

A complete abstract of the paper referred to in the above discussions appeared in the December 1930 issue of MARINE REVIEW.





# Useful Hints on Cargo Handling



**P**LATE glass from Europe to Pacific coast ports had long been a source of trouble on account of the large percentage of breakage, particularly during the winter months. The fact that this commodity must always be kept on edge, combined with the difficulty of handling on account of size and weight of cases, has resulted in stowage in the square of the hatch where the cases can be stowed on edge with a minimum of handling.

An investigator was set to work and watched the complete discharge of plate glass shipments from several ships, two of which had encountered considerable heavy weather in winter voyages across the Atlantic. He found that the cases were reinforced with heavy horizontal battens to provide stiffness and strength and that, on account of the varying heights of cases and the number of battens employed, the battens of adjacent cases had frequently become wedged together under the pressure of cargo caused by the rolling of the vessel. It was next to impossible to break these cases out of stowage without damage because they were not only wedged together but had filled the entire square of the hatch and prevented the working of the cargo in the wings and fore and aft of the glass which, if it could have been worked, would have easily freed the glass. This situation was corrected by the requirement that vertical dunnage be used between cases so that the battens could not be jammed together.

It was further noted in this study that large cases and small hatches made it almost impossible to load or discharge without the cases occasionally striking hatch coamings. It was



*Slingload Made Up With Care*

*THIS page is to be devoted to short items on all matters having to do with the more efficient turn-around of ships. These items are intended to be of a helpful nature.*

*We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.*

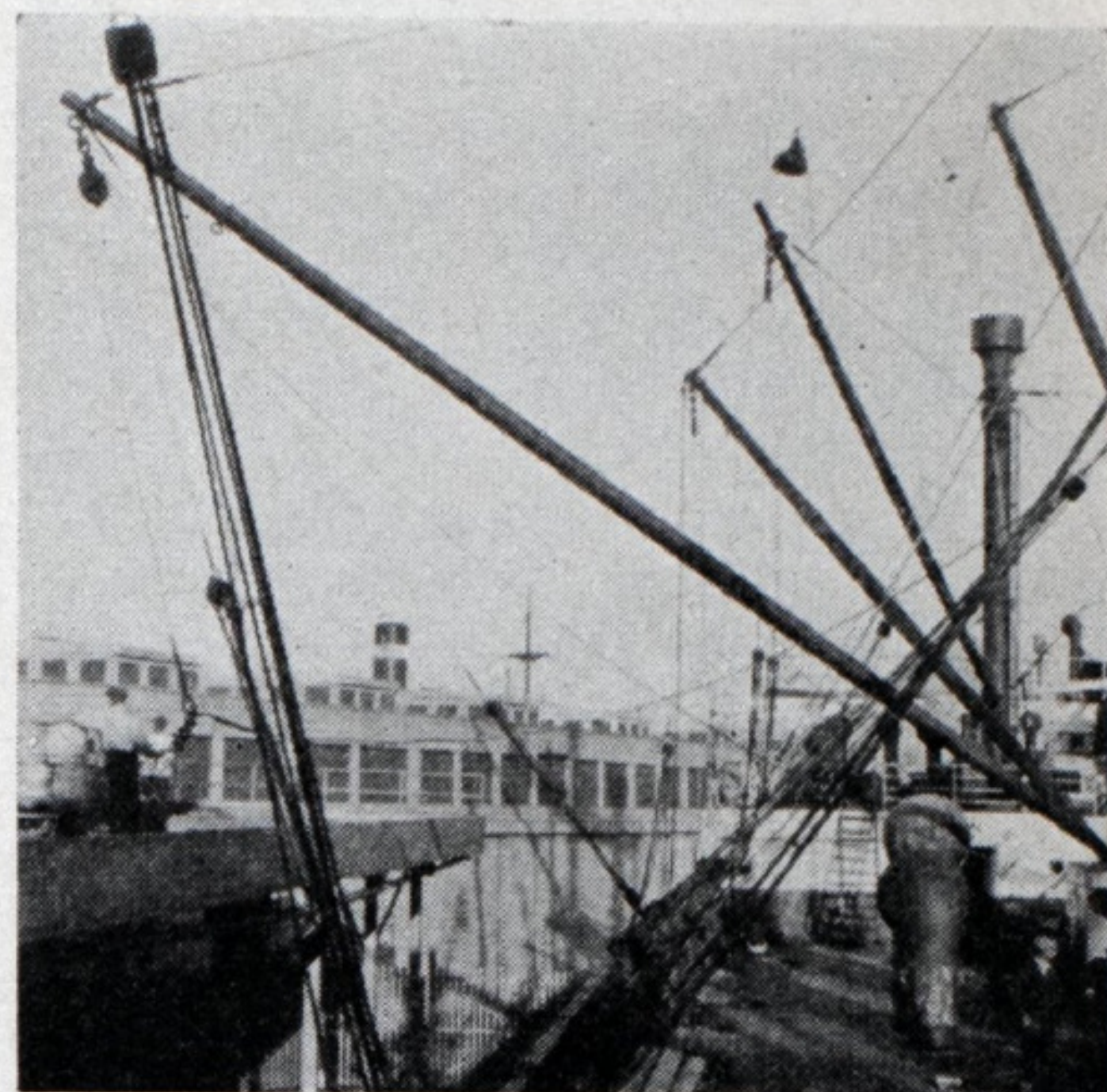
therefore decided that the cases should be redesigned to include diagonal battens so as to prevent distortions of the cases by corner blows and to make these diagonals of equal thickness with the horizontal battens to prevent the cases becoming wedged together. This would relieve the steamship company of the necessity of using vertical dunnage as well as prevent damage by corner blows.

Blueprints were prepared showing this and minor improvements and together with an exposition of their advantages were sent to both consignees and shippers' representatives. Although the suggestions were not adopted in full, they did result in the general use of vertical pieces between horizontal battens to prevent in part distortion of cases and in full wedging of cases and the extent of breakage was considerably reduced.

At a Boston terminal gravity roller conveyors are used to handle small cases such as canned goods from forward part of motor trucks to the platform of the terminal. Other companies use this type conveyor in the ship for moving cases to and from the wings.

## Lubricating Cargo Falls

**A** BARREL is cut in two halves and filled with a quantity of oil of a kind suitable to the individual master or marine superintendent and placed under a deck beam or other suitable means for fastening a handy billey. When the vessel leaves her final port of discharge or loading the cargo falls are made up in coils, the diameter of these to be a little smaller than the diameter of the barrel and placed there to soak in the oil for as long a time as possible. After which they are hoisted up and left hanging over the barrel allowing the surplus oil in the wire to fall back into the barrel. This method saves time and oil and allows



*Length and Location of Booms*

the oil to permeate the core of the wire and thus providing good lubrication for the wire.

## Platform Sling for Cartons

Cartons must be handled exclusively on a platform (aeroplane) sling. They must be handled in such a way that the contents support the package. They must be stowed on absolutely flat surface from start to finish. The side which must be stowed up is generally marked on the box. If there is no mark a corner should be cut to see that the right side comes up. If cartons are stowed on the side, the contents break adrift, and there is no way of repairing the package. Glass is often shipped in cartons but is always so marked and the glass is always packed in corrugated wrappings within the carton. Glass, of course, must be handled very carefully.

Two important cargo handling principles:

1. Economy in handling cargo is obtained by *not* handling it.
  2. The most economical movement is the shortest practical movement.
- This is the straight line productive principle of manufacturing applied to cargo handling.

Two men were saved by loading bags of sugar from motor truck to trailer instead of unloading to floor of dock and then rehandling.

Out-of-date equipment should not wear out, it should be thrown out and replaced better equipment.

Booms should be kept raised wherever practical. This is practical more than it is practiced, as experience of some skippers has proved.



# Equipment Used Afloat and Ashore

Totally Enclosed Fan Cooled Motor—New Burner for Oil or Powdered Fuel  
—Glue Pot of New Design—Propeller Blower—Electric Air Oscillator

**A** TOTALLY enclosed, fan cooled, induction motor which embodies numerous new and unusual features has recently been announced by The Lincoln Electric Co., Cleveland, manufacturers of "Linc-Weld" motors and "Stable-Arc" welders. This new motor, shown in the accompanying illustration, is so ingeniously designed that its rise in temperature is said to be considerably less than the allowable rise for motors of this type. The design of this motor also includes arc-welded steel construction, double-sealed ball bearings, and a removable cover which facilitates easy cleaning of the unusually large radiating surface.

The large radiating surface is obtained by complete enclosure of sides of the motor with a deeply corrugated sheet of corrosion resisting metal. This conducts the heat created within the motor to its outer radiating surface which is constantly cooled by a continual draft of fresh air passing over the radiating surface.

The air imprisoned within the completely sealed frame is constantly circulated by a fan arc-welded to the rotor. This fan drives the heated air within the motor to continuous contact with the large corrugated cooling surface. The outside air which drives the heat from the radiating surface is forced over the exterior of the corrugated sur-

face by a large arc-welded fan attached to the motor shaft. The outside air is drawn in at one end of the motor and expelled at the other end.

The corrugated cooling surface is easily accessible for cleaning as the one-piece cover can be removed by loosening the two thumbscrews which hold it securely in place. This feature permits maintenance of highest possible radiation at all times.

The frame is fabricated of arc-welded steel to give it exceptional strength and rigidity. The stator laminations are stacked in the frame by hand, then subjected to extremely high pressure. While under pressure they are permanently affixed by a retainer ring which is arc-welded to the frame, making the stator core an integral part of the motor frame. The rotor core is formed by hot-riveting the laminated iron while under high pressure. On motors built by this company, 28-gage laminations are used both on the stator and rotor cores, rather than the usual 26-gage laminations to insure better electrical characteristics. To insure complete enclosure of the motor the rolled steel end plates are machined to accurately fit the end rings of the motor frame. The ball bearings which enclose the shaft opening in the end plates are sealed both inside and outside.

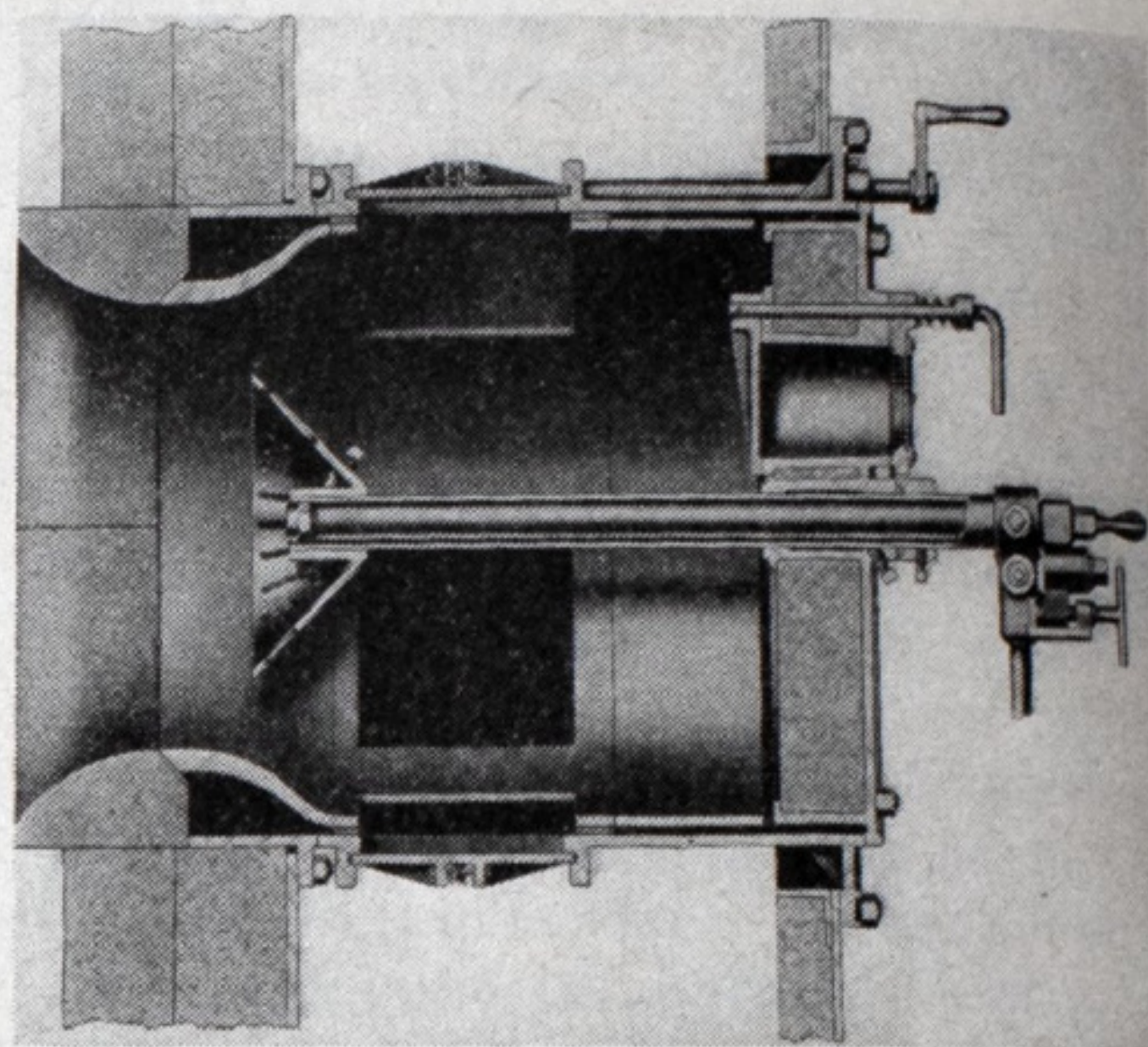
This new motor has the same mounting dimensions as standard, open type, horizontal motors of equal rating. It is manufactured in sizes from 1 to 50 horsepower.

## New Type of Burner for Oil or Powdered Fuel

**O**NE of the newest developments in mechanical oil burning systems is a new model register known as Type C, just announced by the Coen Co. Inc. Burners made by this company have been used for many years by private and government shipbuilders. This type burner has a square frontal design and has been built to meet changing conditions requiring a forced draft with preheated air running up to 1000 degrees Fahr. Yet this new design is equally suitable for either natural or induced draft.

The vane wheel, a part of most cylindrical registers, has been eliminated, air being taken through four large tangent ports, giving the same

effect as a vane wheel but materially reducing air friction. All portions of the register are constructed of the finest grade of heat-resisting steel and are easily accessible.

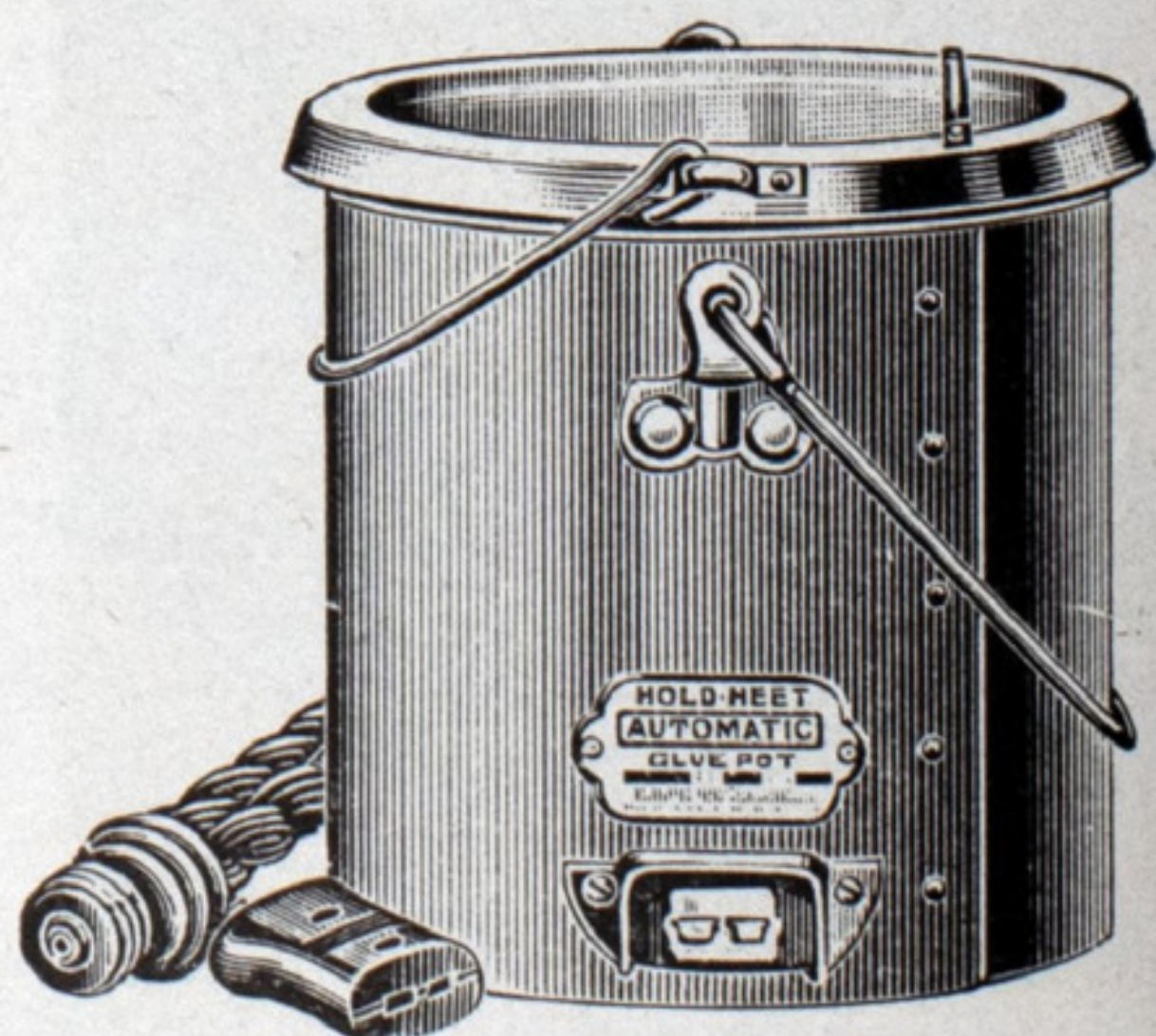


*New Burner for Either Natural or Induced Draft*

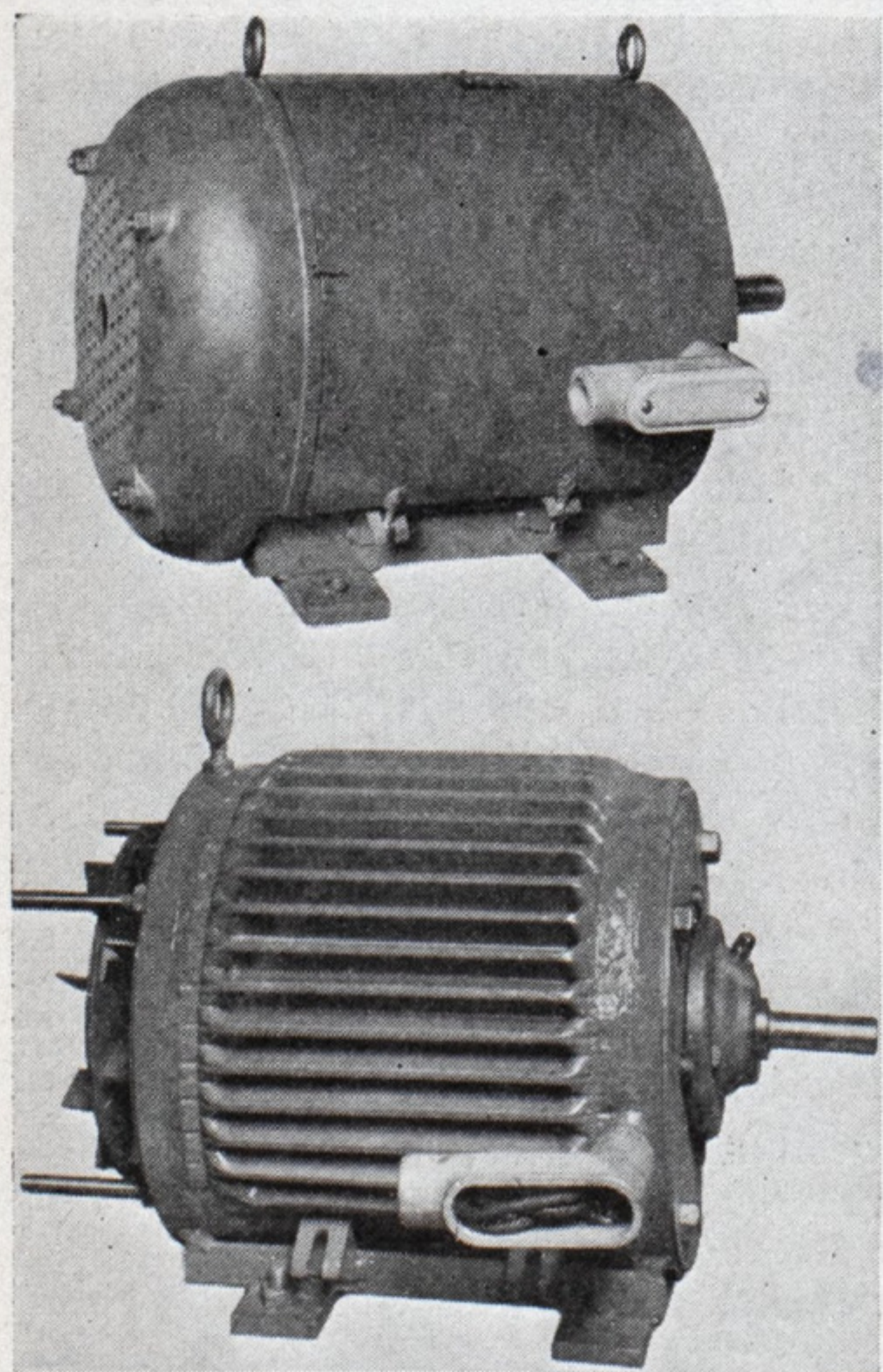
Design of the register makes installation easier and more substantial, while it is possible to materially increase the frontal insulation. The register may be used separately for either oil or powdered fuels or in combination. Register presents an admirable combination of efficiency, durability and a wide range of adaptability.

## New Hold Heet Glue Pot

**T**HE 1931 model of its Hold Heet automatic electric glue pot has just been brought out by the Russell Electric Co., Chicago. This pot has been in use since 1914 and the new model, "built like a boiler," contains two outstanding improvements. Heavy boiler plate has been used in the construction of the outside, making it practically impossible to injure the pot no matter how abused, and a new contact thermostat has been added which regulates direct from the glue chamber temperatures rather than from the air temperature between the walls, as has been customary.



*1931 Model Electric Glue Pot*

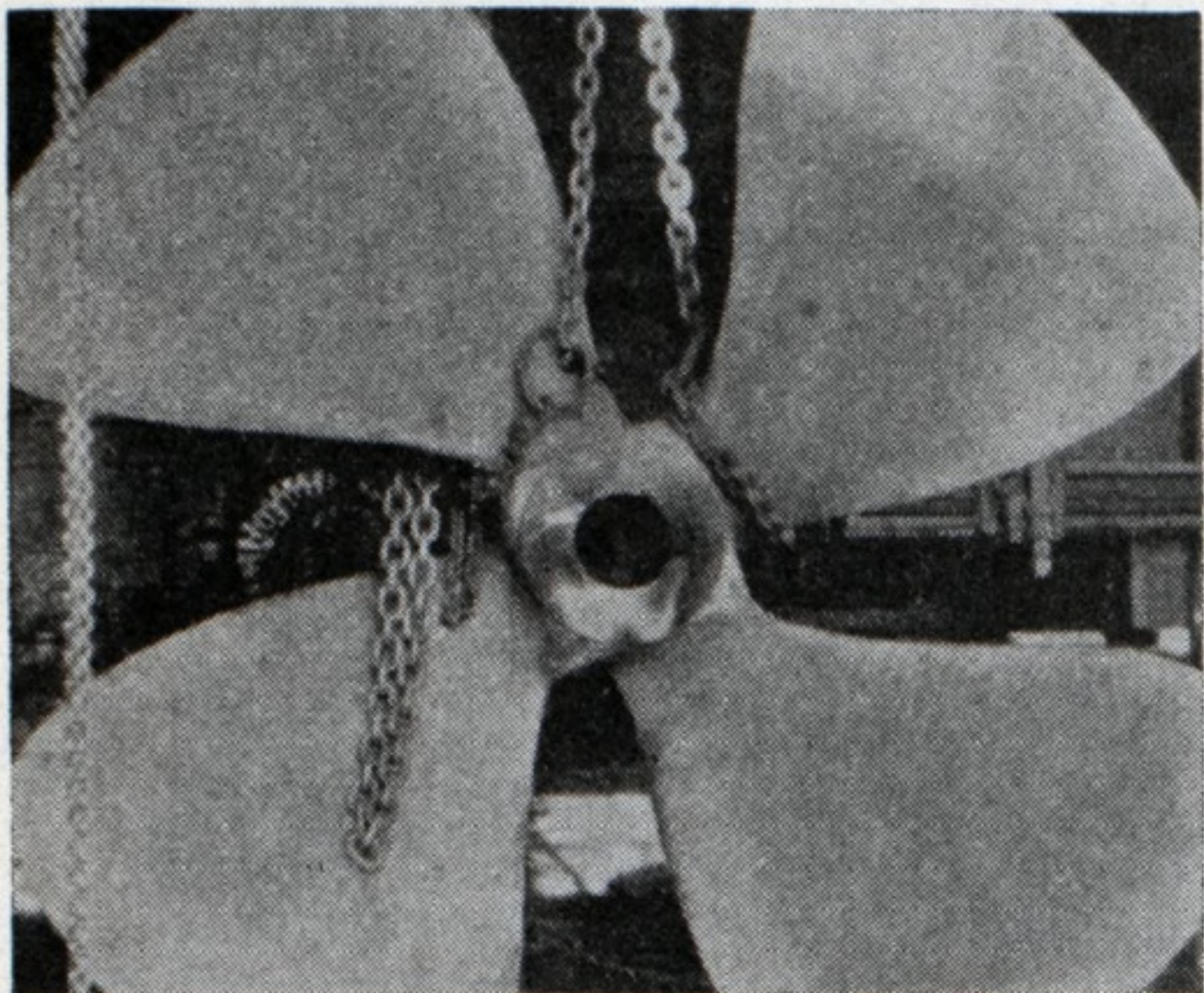


*Two Views of Fan Cooled Induction Motor with Cover On (Upper) and Off*



## How Propeller is Reclaimed by Bronze-Welding

**A** SOUTHERN shipyard was faced with the problem of a propeller shaft-way which had been bored over-size in the hub of a four-bladed steel propeller. In ordinary practice, the whole casting would have been condemned by the shipwright, which would have necessitated the expense



*Shaft Hole of Propeller Built Up*

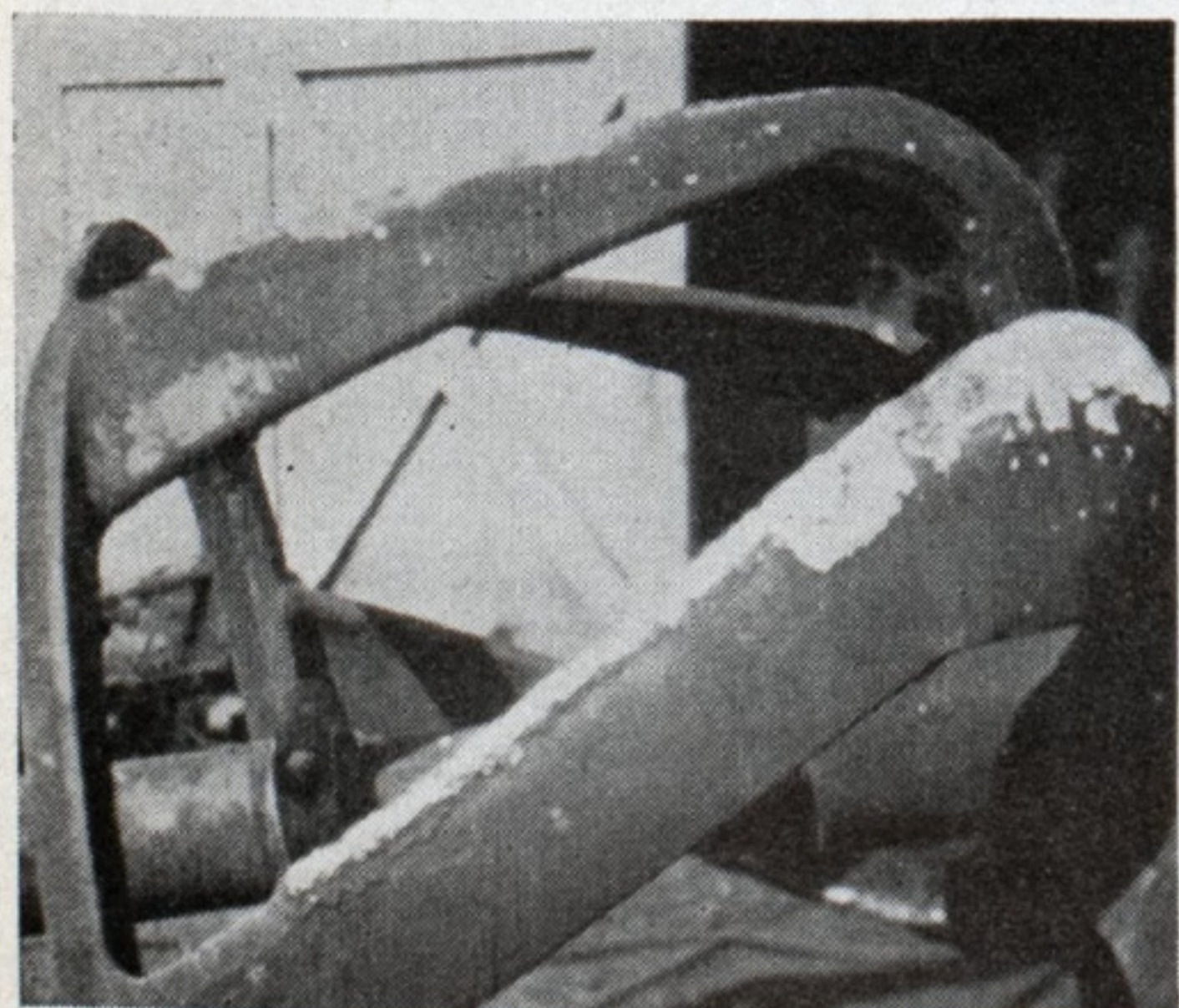
of ordering a new casting and delaying the work for a considerable length of time.

The welding department decided to build up the shaft hole by bronze-welding. The interior circumference of the shaft-hole was built up and then machined to fit. The illustration shows the propeller after bronze-welding had built up the shaft-way.

## Cutter Blades Preserved by Hard-Facing Edges

**A** COMPANY in Maryland maintains a fleet of dredges that are constantly engaged in harbor improvement work. The bottom of the bay is mainly sand, and considerable difficulty results from the wearing away of the steel cutter blades due to abrasive action.

These rotary cutters consist of a steel casting having six spiral blades, extending from an annular base and terminating in a central point which is attached to the drive shaft. A heavy frame, known as the ladder, supports the drive shaft and the cutter. One end of the ladder is attached to the deck of the dredge and op-



*Blades of Cutter with Stellite Edges*

erates in the manner of a hinge so that the cutter can be raised or lowered by a hoisting boom. On the underside of the ladder is the suction pipe. The sand is loosened by the rotary cutter and drawn through the pipe by a centrifugal pump and forced out at the point of disposal.

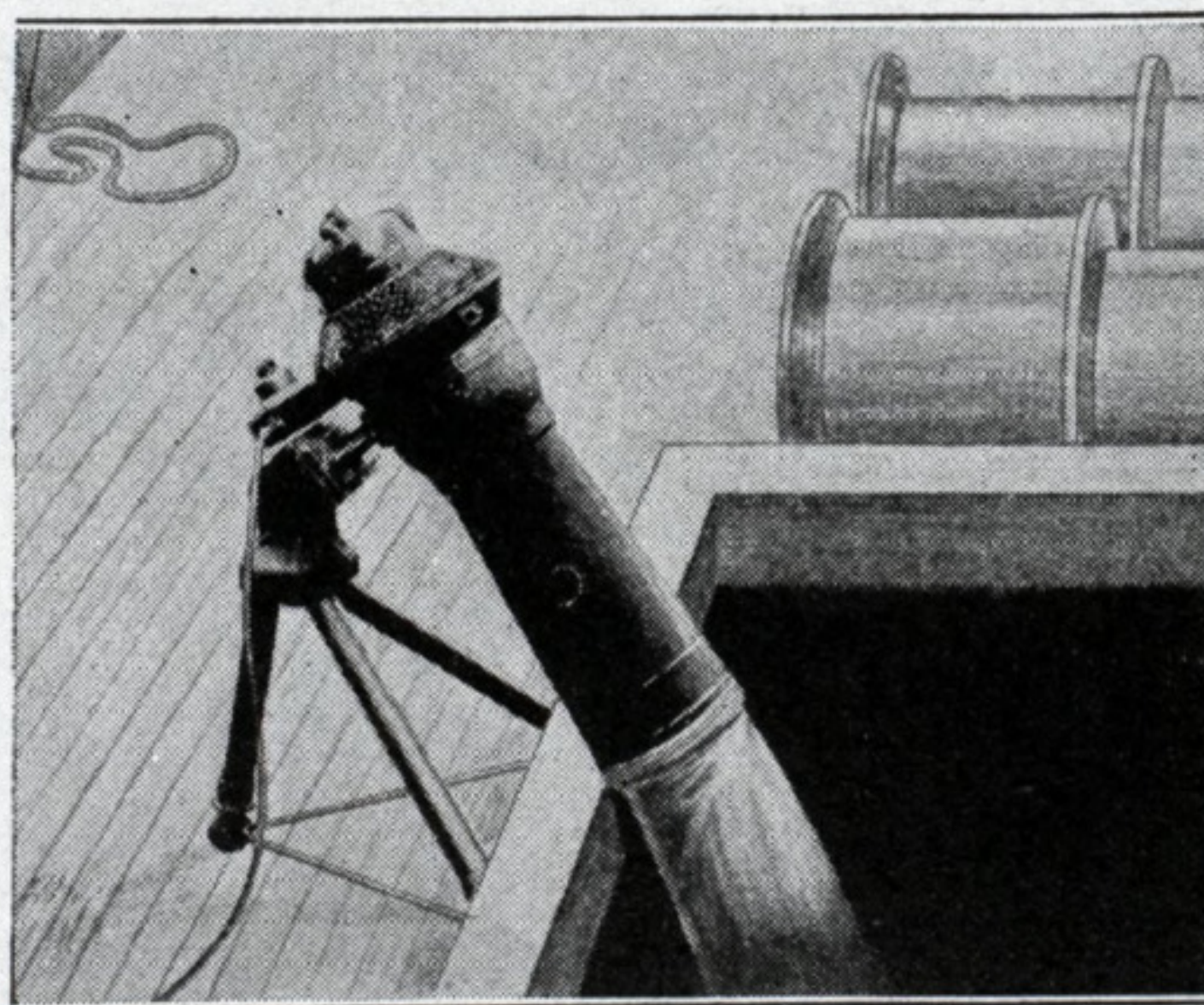
The six cutter blades are about 12 inches wide, one inch thick and taper to  $\frac{3}{8}$ -inch at the cutting edge. In an effort to lengthen the life of these blades the company applied Haynes Stellite to some parts of the cutting edges of the blades of one of the cutters as an experiment. At the end of one year the sand cutter was removed from service and inspected. The hard faced parts were only slightly worn while the uncoated metal of the cutter was worn away to such an extent that an early replacement was necessary.

As a result of this test, the dredging company now hard faces with Haynes Stellite all blades as shown in the accompanying illustration. Sections of the blades about 4 inches wide and 25 inches long were hard faced along the edges as shown.

This procedure increases the life of these cutters many times and has effected a savings in both time and money for this dredging company.

## Propeller Type Blower Will Exhaust Gases

**T**HIS unusual looking piece of equipment is a Westinghouse propeller-type blower of special design



*Welded Propeller Type Blower*

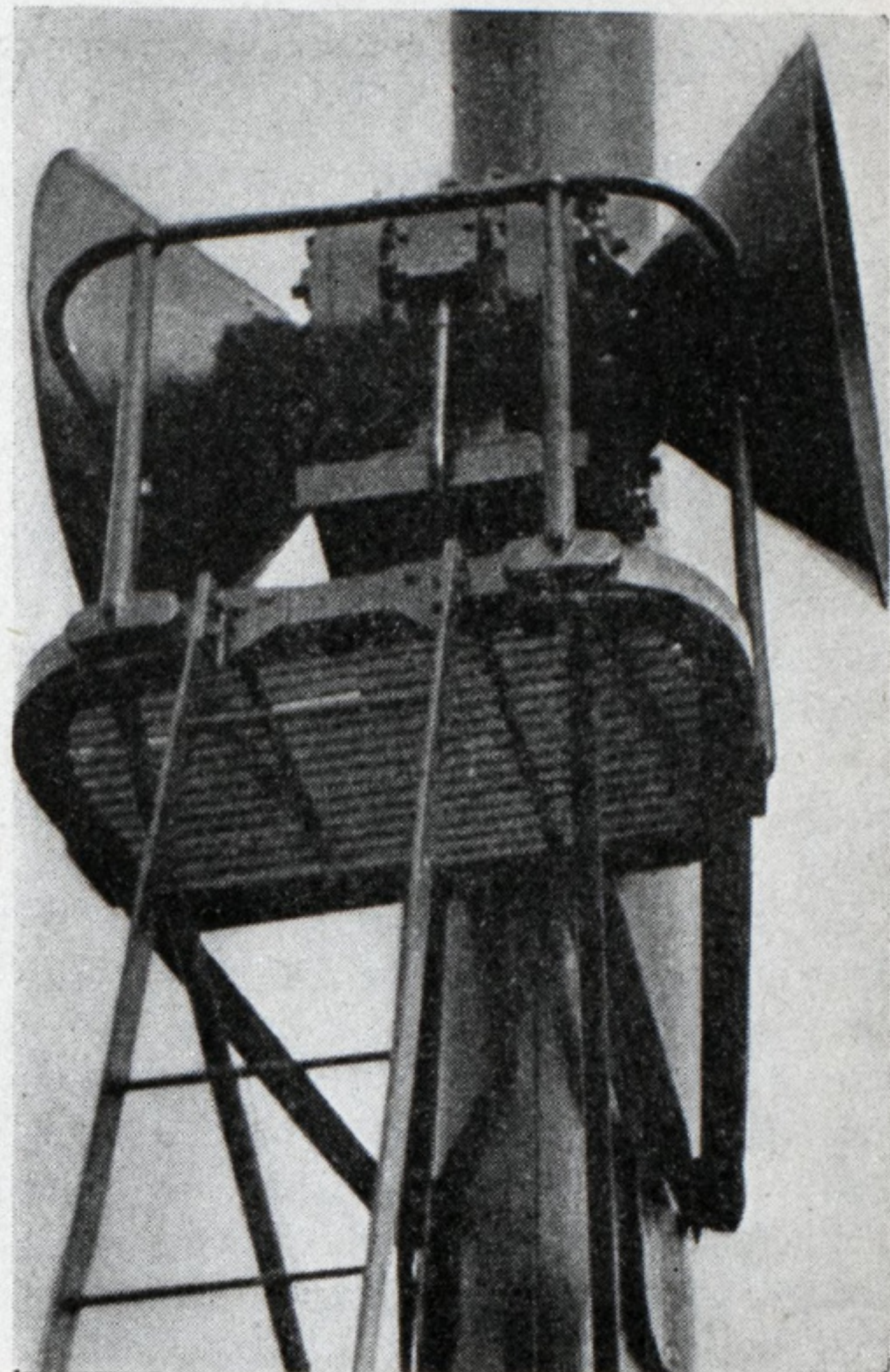
which is to be installed on a gasoline tanker to exhaust the gases from the pump room to the atmosphere. The blower is turbine driven and is rated at 6000 cubic feet per minute at 4-inch static pressure.

The entire unit is of welded steel construction and of extremely simple design. The propeller is three-bladed and is driven by a single-wheel turbine having inside buckets milled in the wheel, through a steel shaft supported in grease-lubricated bearings.

This is another application of the Westinghouse blower, which is an invention of H. F. Schmidt, consulting engineer, and is built at the South Philadelphia works of the Westinghouse Electric & Mfg. Co.

## New Electric Air Oscillator Has Double Horns

**A** MORE powerful electric fog signal to increase the safety of navigation has been installed by the lighthouse department on each of three new lightvessels which are to go into commission shortly. This



*New Electric Air Oscillator in Place*

new signal is a powerful type of electric air oscillator. The three new lightships will replace the three older ships which have given many years of excellent service at Nantucket Shoals, Fenwick Island Shoal, and Frying Pan Shoals.

The electric air oscillator is similar to those which have been in operation at a number of shore stations and lighthouses. A smaller and less powerful type of electric air fog signal, known as the "nautophone," has been in operation at several stations.

The installation of these electric air oscillators upon lightships and at shore stations marks another advance in the use of electricity for navigating purposes. The accompanying illustration gives a good idea of the construction used in mounting the fog signal on the new Nantucket Shoals lightship.

The use of double horns pointed in opposite directions allows for a more uniform distribution of sound throughout the horizon than can be obtained with a fog horn having but a single horn. The pitch of the sound signals emitted by this latest type of fog signal is musical. It differs from the harsh raucous signals which are characteristic of many fog horns operated by steam or compressed air. The maximum intensity and uniform pitch of the signals are maintained throughout the duration of the blasts and for the time desired.



# Up and Down the Great Lakes

Illinois River Channel—Radiobeacons—Year-Round Service—Lake Levels—Ore Movement Less—Ship Auto Parts—Capt. Fick Dies

**A**N EMERGENCY appropriation by congress soon is expected to start work early in January on the Illinois river channel link of the Great Lakes-Gulf waterway project. Following a recent conference between Gov. L. L. Emmerson of Illinois and Secretary of War Patrick J. Hurley it was announced that Illinois is ready to build 12 bridges with which the waterway project must be spanned. This is one of the features of the state's part of the joint federal-state waterway agreement.

A \$22,500,000 deficiency bill is before congress to supply funds for the waterway development, one item of which is for the Illinois project. Illinois already has spent \$20,000,000, and the Chicago sanitary district \$70,000,000. The federal government, according to an agreement made in 1930, will complete the Lockport-Utica stretch in Illinois at a cost of \$7,500,000.

Engineers say the waterway project can be completed within two years. Haste was made in getting the work started at this season to provide relief for unemployment.

Committees of the Chicago association of commerce have recommended the creation of a regional port commission, which would systematically map out Chicago's harbor development in preparation for the opening of the Illinois waterways project.

## Operation of Radiobeacons

With the closing of navigation on the Great Lakes, which will be virtually complete by the end of December, the system of United States radiobeacons operated upon these lakes reached the point where all 29 stations were automatically operated, according to the lighthouse service of the department of commerce.

## Offers Year-Round Service

What is probably the first attempt in the history of shipping on the Great Lakes for a boat line to maintain an all-year freight service was inaugurated recently by the Detroit & Cleveland Navigation Co. in a regular daily freight trucking service from Cleveland to Detroit. At the beginning of the past season the Detroit & Cleveland line established a system of store-door delivery and pickup serv-

ice for the accommodation of shippers between Cleveland, Detroit, Buffalo and Chicago. The success of this service induced the company to inaugurate the daily trucking service between Cleveland and Detroit. Prior to this year patrons were compelled to seek other means of transporting their freight from Detroit to Cleveland after the close of navigation. With this new development there will be no interruption in the freight service during the entire year. This will give employment to men and terminals which ordinarily would be idle through the winter months.

## November Lake Levels

The United States Lake survey reports the monthly mean stages of the Great Lakes for the month of November as follows:

Lakes	Feet above mean sea level
Superior .....	602.50
Michigan-Huron .....	579.82
St. Clair .....	574.78
Erie .....	571.84
Ontario .....	245.65

Lake Superior was 0.27 foot lower than in October and it was 0.27 foot lower than the November stage of a year ago.

Lakes Michigan-Huron were 0.54 foot lower than in October and they were 1.34 feet lower than the November stage of a year ago.

Lake Erie was 0.45 foot lower than in October and it was 0.95 foot lower than the November stage of a year ago.

Lake Ontario was 0.59 foot lower than in October and it was 1.01 feet lower than the November stage of a year ago, 0.53 foot above the average stage of November of the last ten years.

## Movement of Ore Decreases

The total movement of iron ore on the Great Lakes for the 1930 season amounted to 46,582,982 tons according to the Lake Superior Iron Ore association. This is a decrease from the movement in 1929 of 18,621,618 tons or 28.56 per cent. The season's total for this year is the smallest since 1924 when 42,623,572 tons were moved. The shipments of ore for November this year reached a total of 1,987,688 tons, a decrease of 1,953,836 tons or 49.57 per cent over the November total of last year which was 3,941,524

tons. The all rail movement of ore for 1930 is expected to be 650,000 tons as compared with 961,764 tons last year.

## Shipments of Auto Parts

Shipments of automotive parts from the Ford plants in Michigan by boat to the new dock of the Ford Motor Co. at Torrence avenue, in the Calumet river, Chicago district, were started late in the 1930 navigation season.

These shipments acted as a stimulus to harbor development for Chicago, as they awakened possibilities of an industrial harbor in Lake Calumet, which is several miles from the outer harbor. The Ford shipments included 8800 motors, 20,000 axles, and many other parts. Most of these parts were used in the Ford assembly plant in the Chicago district, while the remainder were shipped by rail from Chicago to Des Moines, Indianapolis, Milwaukee and other points. The Ford dock, which is 570 feet long, was not used to any great extent during the last navigation season, partly as a result of the slow automotive demand during the past year.

## Lake Captain Dies

Captain F. Allen Fick, one of the best known and most picturesque characters on the Great Lakes, died at his home in Cleveland, Dec. 11.

Captain Fick was born at Port Rowen, Ont., March 23, 1844. He began sailing at the age of 12 and was master of a little 90-ton schooner at the age of 17. He was with the Tomlinson fleet for a number of years, during which he brought out the SONORA, the SINABLOA, and the JAMES E. DAVIDSON.

Captain Fick saved many lives during two ship disasters. This occurred when the steamer KASOTA was cut in two when struck by the passenger boat CITY OF DETROIT in July 1890 and also when the steamer FEDORA of which he was part owner caught fire.

Captain Fick was a second cousin of Thomas A. Edison and knew intimately President Grover Cleveland, Admiral George Dewey, Senator Marcus A. Hanna, and included Mrs. Alice Roosevelt Longworth and Ethel Barrymore among his friends. Capt. Fick is survived by his widow, Mrs. Mary Thornton Fick.



## Help Unemployed Seamen Through Board Ruling

In order to provide employment for an additional number of seamen during the present crisis, the Merchant Fleet Corp. has authorized its managing operators to employ temporarily one ordinary seaman in place of the deck boy rating. The instructions will not be made permanent, as it is not desired to abandon the training of deck boys which was initiated by the board several years ago.

That the present unemployment situation fully warrants provision being made for employing some of the many idle seamen in our ports is recognized in this action. The records of the board's sea service bureau indicate that during the fiscal year ended June 30, 1930, 1454 deck boys were placed, but the urgency of giving employment to the older men who are dependent entirely upon their calling for a living has prompted a temporary suspension of the deck boy rating.

President Hoover and the bureau of the budget have recommended to the house that the appropriation for maintenance and operation of the Panama canal for the fiscal year 1932 be \$15,500,000 instead of \$12,000,000 as previously recommended. He also recommended that congress increase the contract authorization for continuation of construction of Madden dam from \$2,000,000 to \$11,250,000.

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THE subject of the 1931 calendar issued by the Columbian Rope Co., Auburn, N. Y., reproduction of which is given below, is a powerful painting of the famous American ship A. J. Fuller, showing her driving before a quartering gale under fore course and topsails. This painting of the Fuller is one of the finest pictures of the era of sail. Interesting details regarding the ship are contained in the printed circular which accompanies the calendar.



## Present Operators Are Awarded Cargo Lines

Following the recommendations of President Hoover's shipping advisory committee whose report was considered by the shipping board on Dec. 11, the board unanimously decided to sell the 23 ships of the American Diamond and American France lines to their present operators, the Black Diamond Steamship Corp. and the Cosmopolitan Shipping Co. respectively. The terms of sale were not provided for, the board rejecting all bids and ordering the return of good faith deposits to bidders and opening negotiations with the postmaster general to determine what mail contracts will be awarded the two lines which are to be sold. The sale price will be affected by the amount of these contracts.

The United States civil service commission announces an open competitive examination for junior engineer in the following branches (optional subjects): Aeronautical, agricultural, chemical, civil, electrical, mechanical, mining, naval architectural, and structural steel and concrete.

Applications must be on file with the United States civil service commission at Washington, not later than Feb. 10, 1931. The entrance salary is \$2000 a year. This examination is to fill vacancies in various services for duty in Washington or in the field and will consist of questions in the branch of engineering selected by the applicant and on other subjects pertaining thereto.



## Fourth National Merchant Marine Conference

THE United States shipping board on Dec. 17 fixed the date and approved the agenda of the Fourth National Conference on the Merchant Marine, to be held in the main assembly hall of the United States Chamber of Commerce building, Washington, on Jan. 21 and 22.

These annual conferences, held under the auspices of the shipping board, have brought together the various groups comprising the American shipping industry and have furnished a common meeting ground and forum for the discussion of outstanding problems relating to the merchant marine and American foreign trade. The spirit of solidarity and co-operation developed at the meetings has proved of the greatest benefit to all concerned.

Among the important topics to be discussed at the January meeting are the training of personnel for the new ships which, under the present building program, are rapidly being added to existing overseas services; the effect of marine engineering development and research on new ship construction; safety of marine workers, afloat and ashore; marine insurance, with special reference to the efforts now being made to have all American risks underwritten by American companies; and the important problem, perhaps the out-

standing item on the program, of securing from American shippers and travelers an increased amount of patronage for American flag ships.

The full agenda approved Dec. 17 by the board is as follows: Unfinished business: Reports of committees on marine insurance, safety of marine workers, reduction of differential between shipbuilding costs here and abroad, government aid to American ships not benefited by mail contracts, training of officer personnel; modernization of the American merchant marine; methods of increasing patronage for American lines, views of manufacturers, agricultural interests, trade associations, traffic clubs, exporters and importers, railroads and shipowners; legislative needs of the American merchant marine; American coastwise and intercoastal shipping; marine engineering development and research; loadline developments; liquidation activities of the Merchant Fleet Corp.

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### Index for 1930

*THE index for the year 1930, covering all the valuable editorial material which appeared in MARINE REVIEW last year, is now ready for distribution. Copies will be sent on request, without charge, to those subscribers who have kept a complete file of copies and desire the index.*

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## Examinations for Boiler And Hull Inspectors

The United States civil service commission announces open competitive examinations for local and assistant inspector of boilers and local and assistant inspector of hulls, steamboat inspection service. Applications for local and assistant inspector of boilers (inland ports other than central western rivers) and local and assistant inspector of hulls (all classes of ports) must be on file with the Commission, Washington, not later than Jan. 13, 1931.

The entrance salary for local inspector is \$3200 a year; for assistant inspector it is \$2900 a year. Competitors in the examination for local and assistant inspector of boilers will be rated on letter writing; arithmetic; boilers, engines, motors, machinery, and inspection; and experience. Competitors in the examination for local and assistant inspector of hulls will be rated on letter writing; arithmetic; hull construction and inspection; pilot rules and inland navigation; inspection laws and vessel equipment, and experience. Applicants for posi-

Applicants for local inspector must have at least three years' experience in a responsible position on board a steam or motor vessel of certain specified gross tonnage; for assistant inspector the experience requirement is two years. At least one year of the experience to be within five years.

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# What the British Are Doing in Shipbuilding

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THE Scottish shipbuilding industry is suffering from the scarcity in new orders and November output was the poorest month of the year both for tonnage launched and new contracts placed. In Scotland there were launched 13 vessels aggregating only 31,900 tons, about half the output for October and no substantial orders were booked. The Clyde output for the eleven months exceeded that for the same period in 1929 by 11,000 tons gross but it was considered very unlikely that the lead would be maintained as the Clyde shipbuilders would have to launch over 77,000 tons in the last month of the year in order to reach the total of 1929.

\* \* \*

ONE of the most important of recent launches on the Clyde was that of the motor tanker **BRITISH PRIDE** which Lithgows, Ltd. built for the British Tanker Co. Tanker tonnage which has been a boon to Clyde shipbuilders is unfortunately being

rapidly exhausted. The **BRITISH PRIDE** is the third tanker which the firm has built during recent months and they have another under construction. The

\* \* \*

THE contract placed with John Brown & Co., Ltd., Clydebank, to build the giant new Cunarder has been signed and sealed and a start made with the laying of the keel. The construction of this steamer will provide employment for about 3000 shipyard workers in Clydebank during the next three years and thousands of workmen in numerous other trades will be occupied in furnishing and fitting out the vessel. When completed she will be by far the largest vessel in the world. The principal dimensions of the vessel were revealed in the house of commons by Secretary W. S. Smith of the board of trade who announced that she would have a length of 1018 feet, a tonnage of 73,000 and a capacity of 7,300,000 cubic feet. It is stated that the re-

sult of many years' research work and experiment among naval architects and marine engineers will be manifest when the vessel is completed. Her propelling machinery will consist of quadruple screws driven by four sets of Parsons turbines with single reduction gearing, steam being supplied by oil fired boilers of Yarrow design.

\* \* \*

THE purchase of three more redundant shipyards for the purpose of dismantling with restrictions on the sale of the sites against their use in future for shipbuilding was officially announced by National Shipbuilders Security Ltd., a concentration company formed in February as a collective scheme within the industry to improve the industry's outlook in international competition and to secure more economical working by the concentration of production. The first of the three yards is that of Napier & Miller Ltd. of Old Kilpatrick.

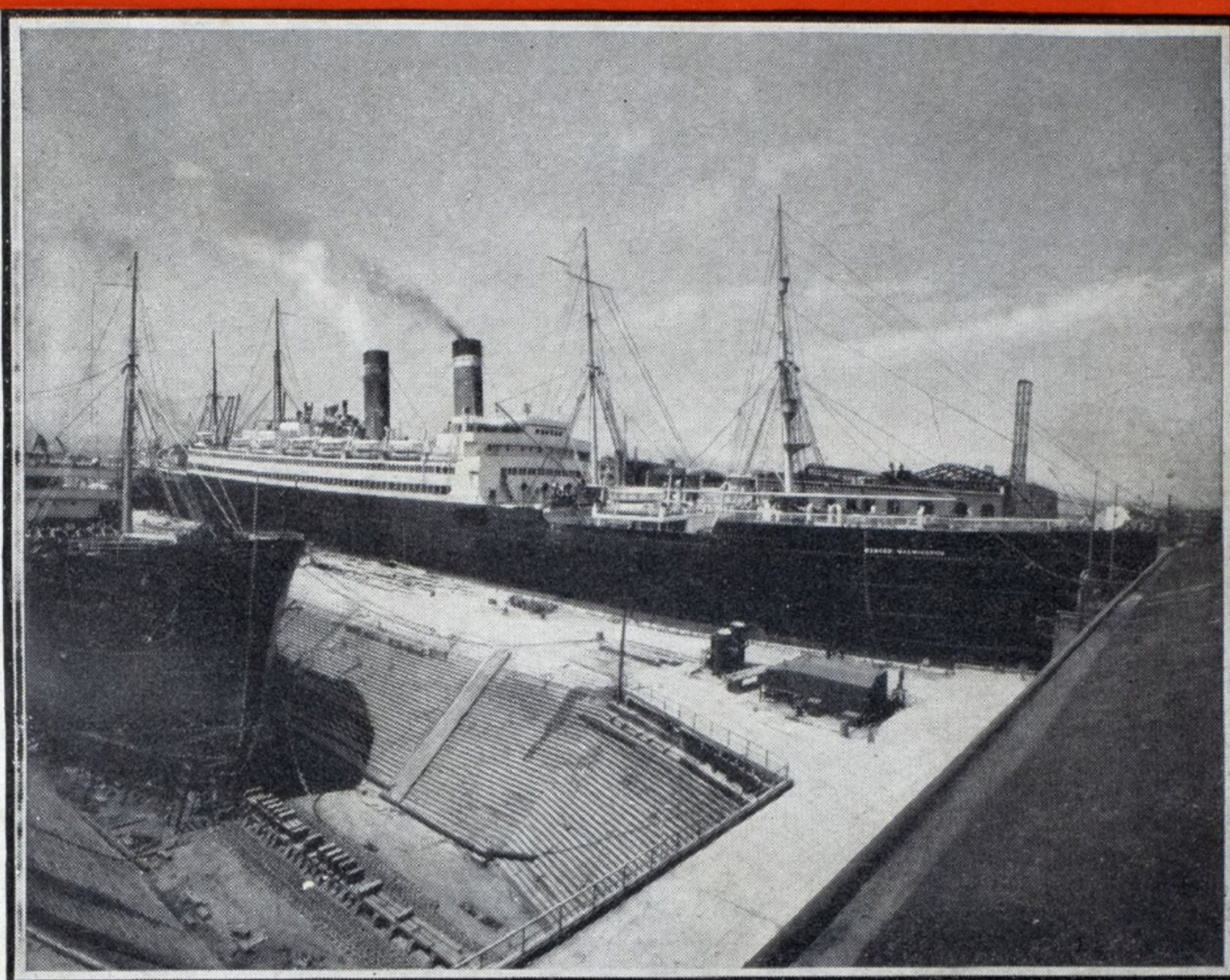


# Marine Review

Reg.  
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The National Publication Covering the Business of  
Transportation by Water

January, 1931



## "S. S. GEORGE WASHINGTON" *{Second largest American Vessel}* in Todd Graving Dock

**T**HE scope of Todd Service is graphically illustrated in the fact that, for the first time in the history of the Port of New York, a vessel of this size has been able to drydock in the Harbor.

With such outstanding docking and berthing facilities and unsurpassed equipment in the Port of New York, every phase of marine repair, conversion, reconditioning and overhaul is immediately available for either regular or emergency operations, and all within the confines of Todd Yards.

The saving in time in having drydocking facilities for large vessels within New York Harbor allows for resumption of sailing schedules much earlier than has hitherto been possible.

**TODD SHIPYARDS CORP.**

25 Broadway, New York

### PLANTS

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24 Floating Dry Docks  
2 Graving Docks 3 Shipways

**LARGEST  
DRY DOCK**

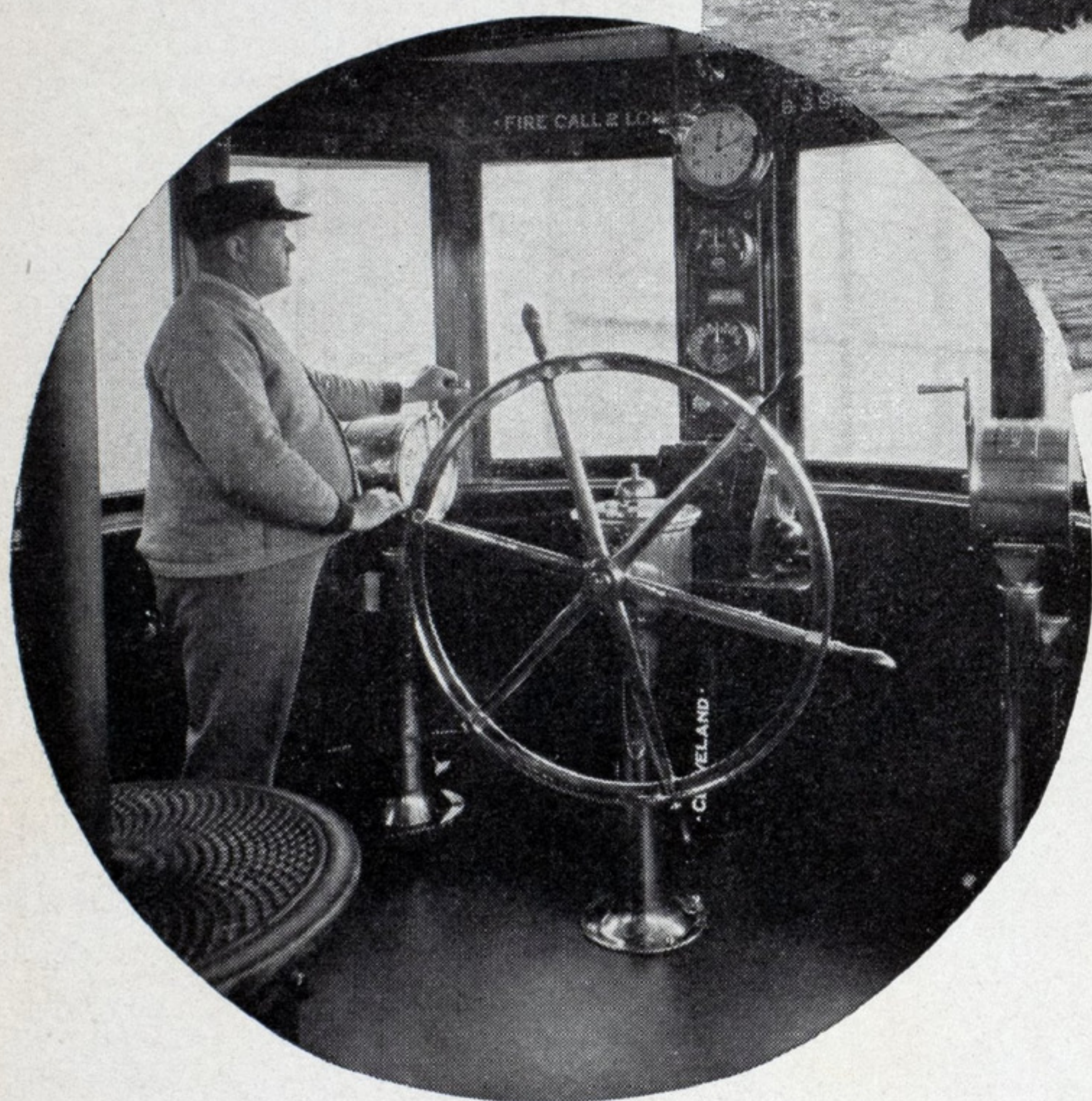
*in* **NEW YORK  
HARBOR**







The Cleveland, one of the four new tugs,  
and (left) the captain in the pilot house.



**Mr. C. F. Blackton**

**Marine Supt. of the Erie R.R.**

**says:**

"Our four new Diesel electric tugs with Ingersoll-Rand Diesel engines are the best in the harbor.

"One of them can handle a 366-ft. car float as though it were a covered barge.

"Control! Why, they almost respond to your thoughts.

"Smooth running!—Down in the engine room you can't tell whether they are moving or not, unless you watch the propulsion motors.

"And those engines—what engines! Two 500-horsepower units on each boat. Ingersoll-Rand has done a great job on them."

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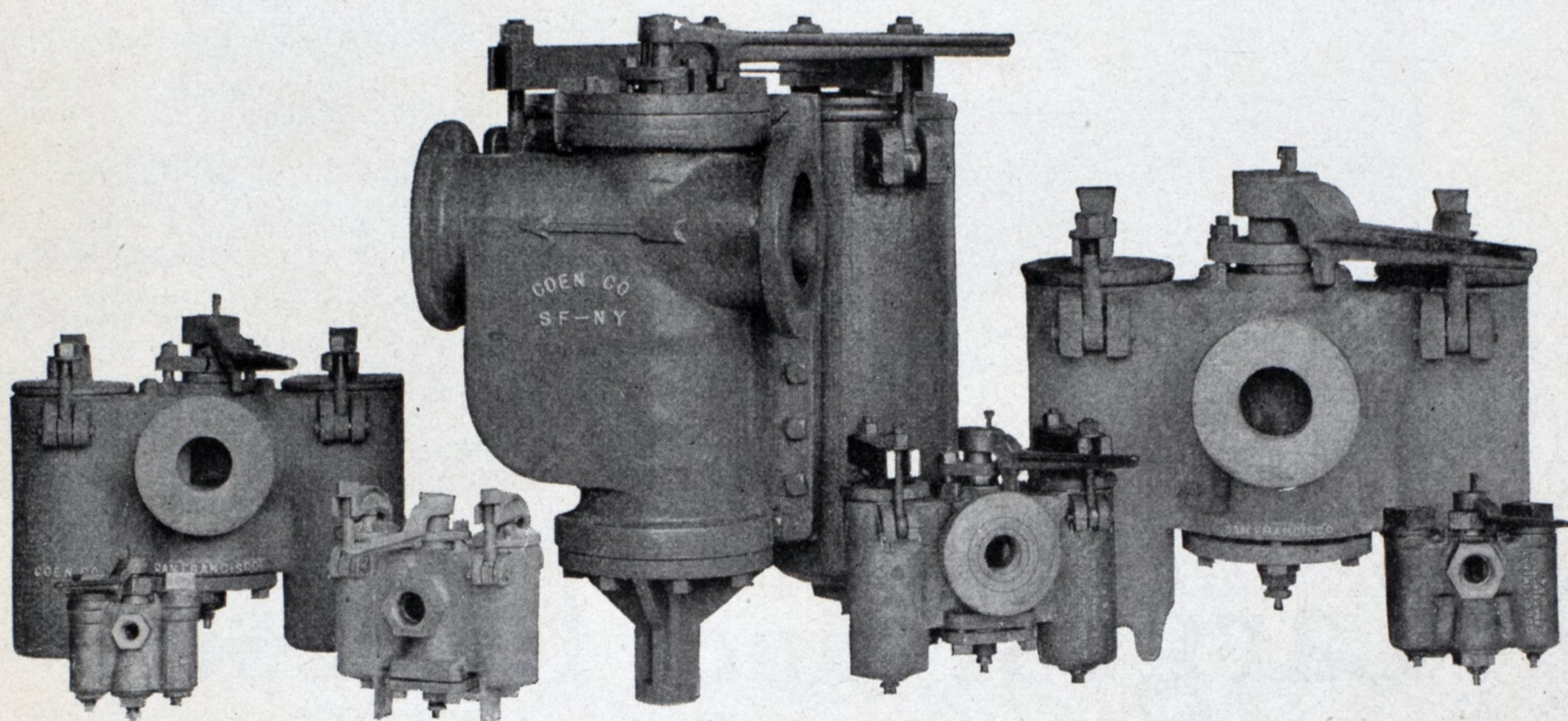
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**Ingersoll-Rand** 93-MOE



# SPEED

## A SECRET OF TURNOVER

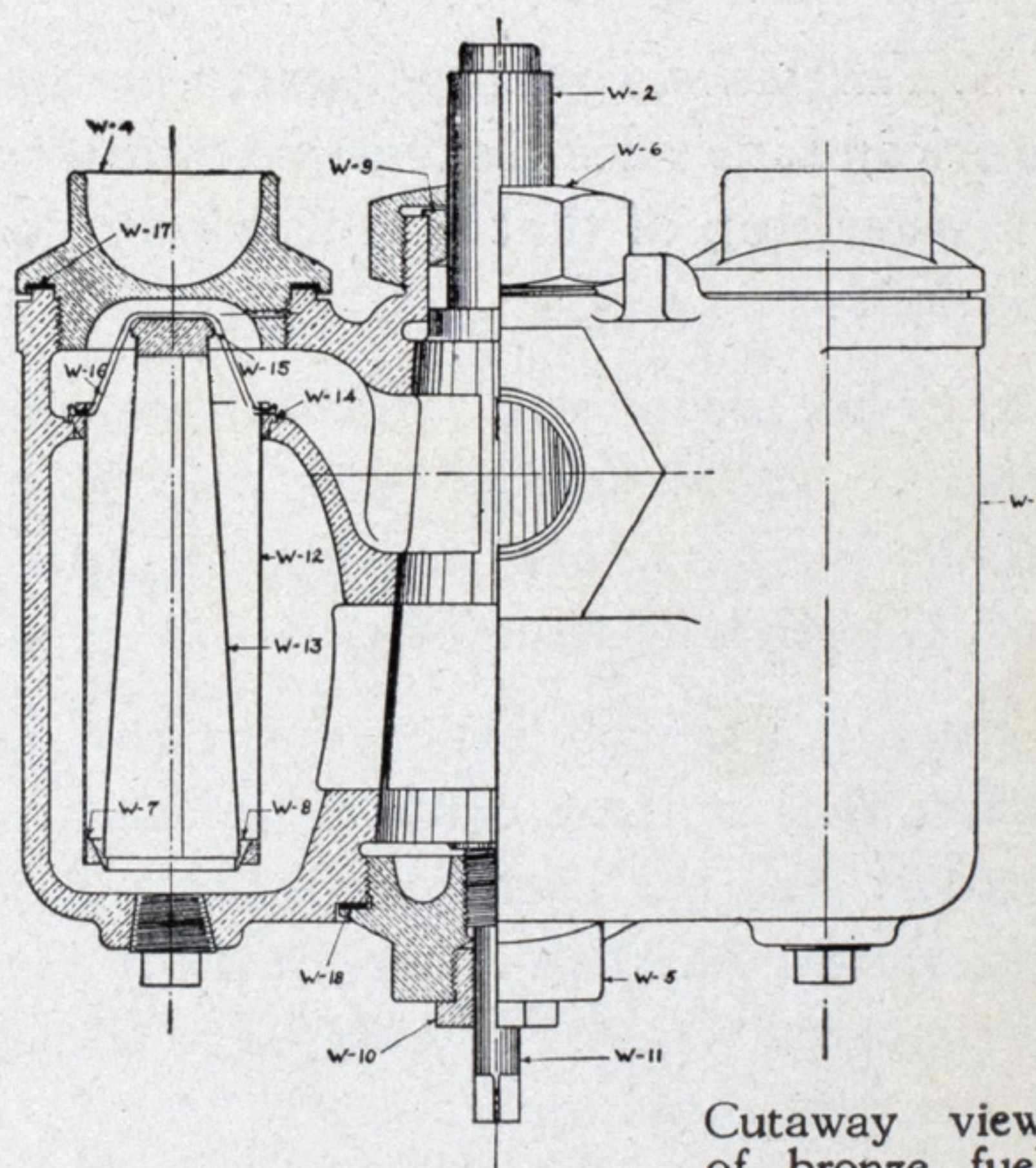


Coen Duplex Strainers can be furnished in sizes from  $\frac{3}{4}$ " to 6" inclusive for either suction or discharge

## Duplex Strainers

Duplex Strainers embrace the features essential for the most rapid and satisfactory operation. A 90-degree turn of the handles changes the flow from one basket to the other without use of valves. The basket being in two parts is more readily cleaned. Strainer is so designed that when the well cover is removed the level of fluid at the well is lowered, exposing the top of the basket for removal. It is impossible to stop the flow regardless of the position of the handle. This type of Duplex Strainer eliminates the many joints necessary in those strainers which are made up of valves and fittings.

Six inch strainers are ordinarily made of close grain cast iron or bronze. Well covers are fitted with tongue and grooved joints and are held tightly in position by means of heavy steel strong backs and hinged steel studs. The baskets are of perforated metal or reinforced wire mesh, or are made to order for special requirements, one double basket offering the combined area of perforations ten times the inside cross sectional area of the pipe. The entire strainer assembly emphasizes compactness, ease of operation and instantaneous access to working parts.



Cutaway view of bronze fuel oil discharge strainer

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COMBUSTION  ENGINEERS

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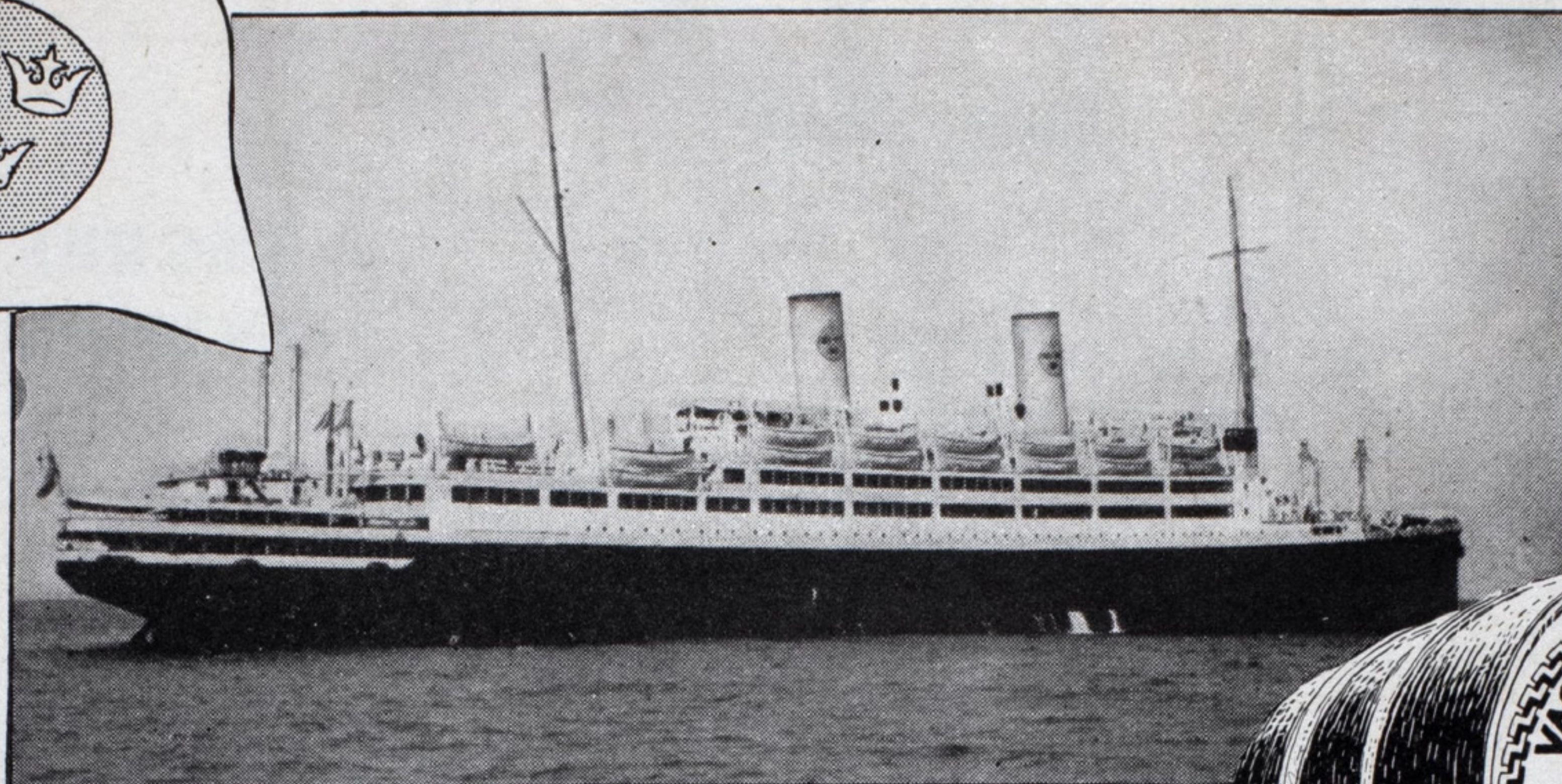
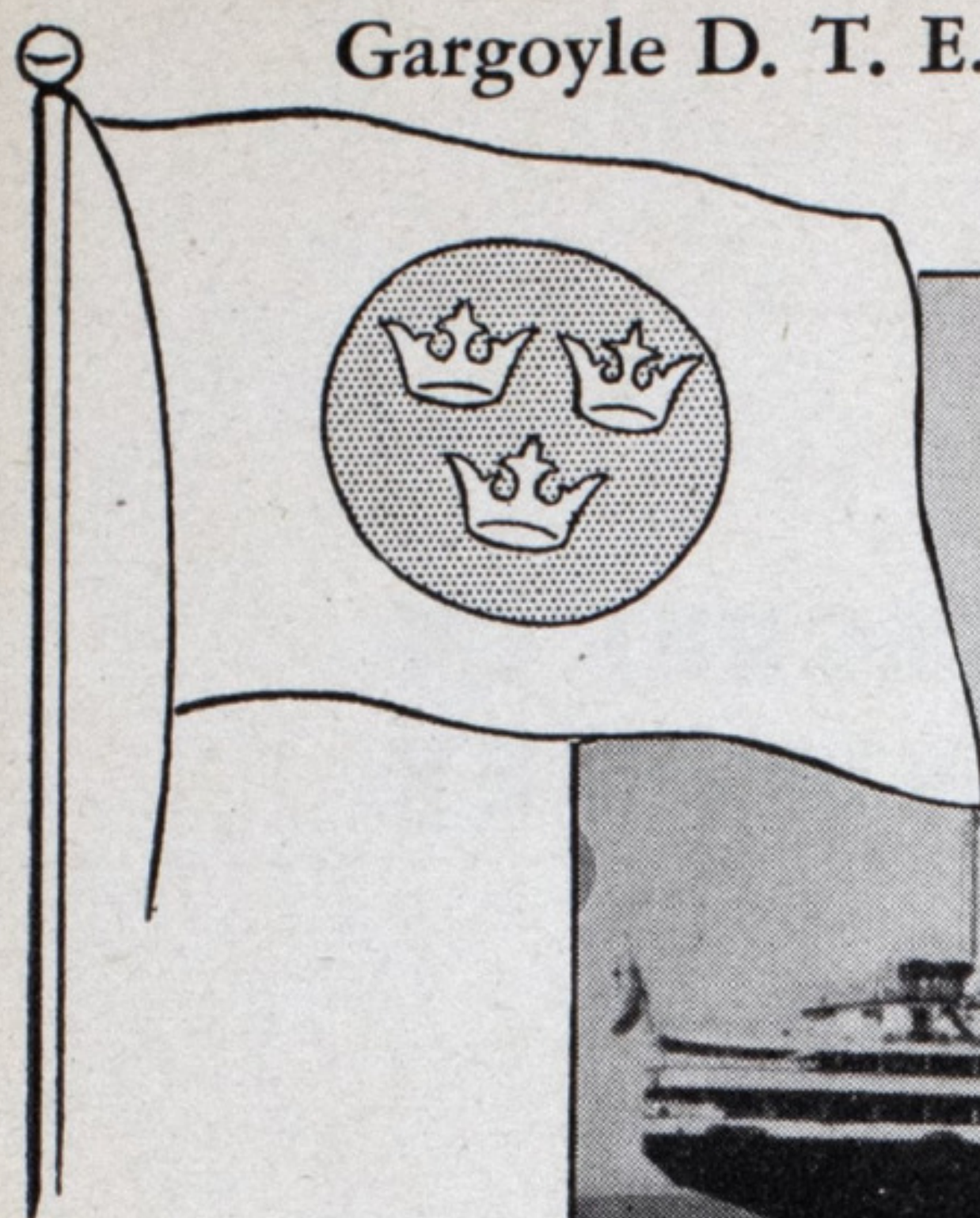
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Gargoyle D. T. E. Oils Lubricate 65% of the World's Diesel-powered Shipping



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*M. S. Kungsholm*, latest addition to the Swedish-American Line's de luxe North Atlantic service, is a sister ship of that famous motorliner, the *Gripsholm*.

After her predecessor's splendid first-year performance it is natural that the *Kungsholm* follows the *Gripsholm* tradition in lubricating with Gargoyle Marine Oils.

Years of first-hand experience with Gargoyle Marine Oils in these crack motorships, and in steamers like the *Drottningholm* and *Stockholm*, have shown Swedish-American Line engineers the practical wisdom of looking to these high-quality lubricants for—

- the best insurance against untimely breakdowns and costly repairs;
- less power loss through friction drag;
- lower fuel and oil consumption;
- longer engine life.

Gargoyle Marine Oils are easily available in more than 300 of the world's leading ports. Experienced Vacuum Oil Company representatives in every one of these ports are always ready to consult with you in meeting your own particular lubrication problems.

NOTE: We will be glad to send you, without obligation, either of our authoritative treatises on Marine Lubrication: "Steamships with Reciprocating Engines," "Marine Lubrication—Motorships." Address your request to: Vacuum Oil Company, Marine Sales Dept. D-11, 61 Broadway, New York City.



## Marine Oils

A grade for every type of service

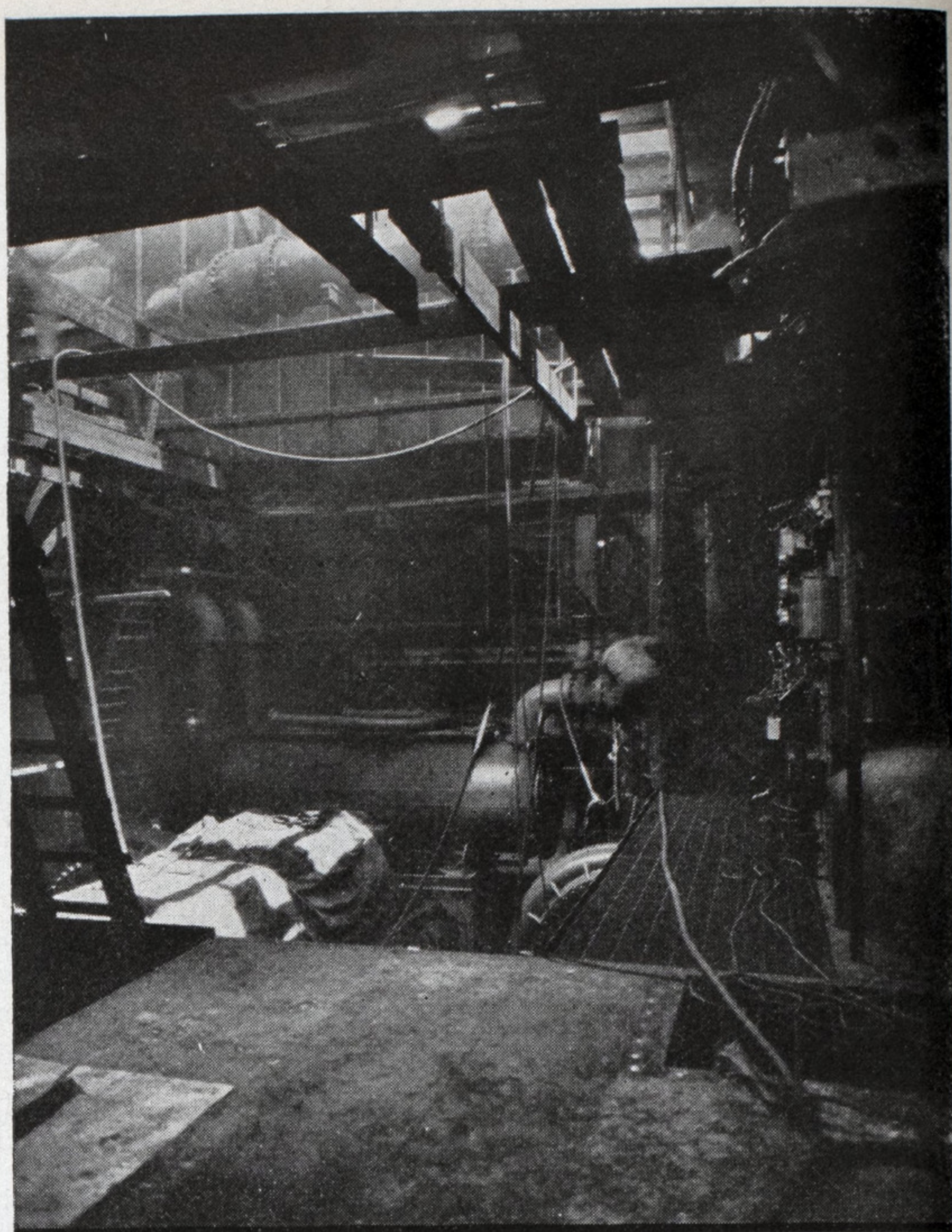
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Specialists in the manufacture of  
high-grade lubricants for every class of machinery  
Obtainable everywhere in the world

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**THRIFT** *says:*  
**Have**  
**AMERICAN**  
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**NOW**



**T**O Lake shipping, as to every other field, 1931 brings the necessity for saving money.

Now is really the thrifty time for you to have American Ship put your ships at maximum operating efficiency. Now your ships are lying idle—laid up for the winter. They have no schedules to maintain. You may avoid costly repair delays this Spring, by ordering American Ship to repair and overhaul them now.

Take advantage of the fact that *now costs are lower*; that *now labor is more efficient*; and that *now materials cost less*.

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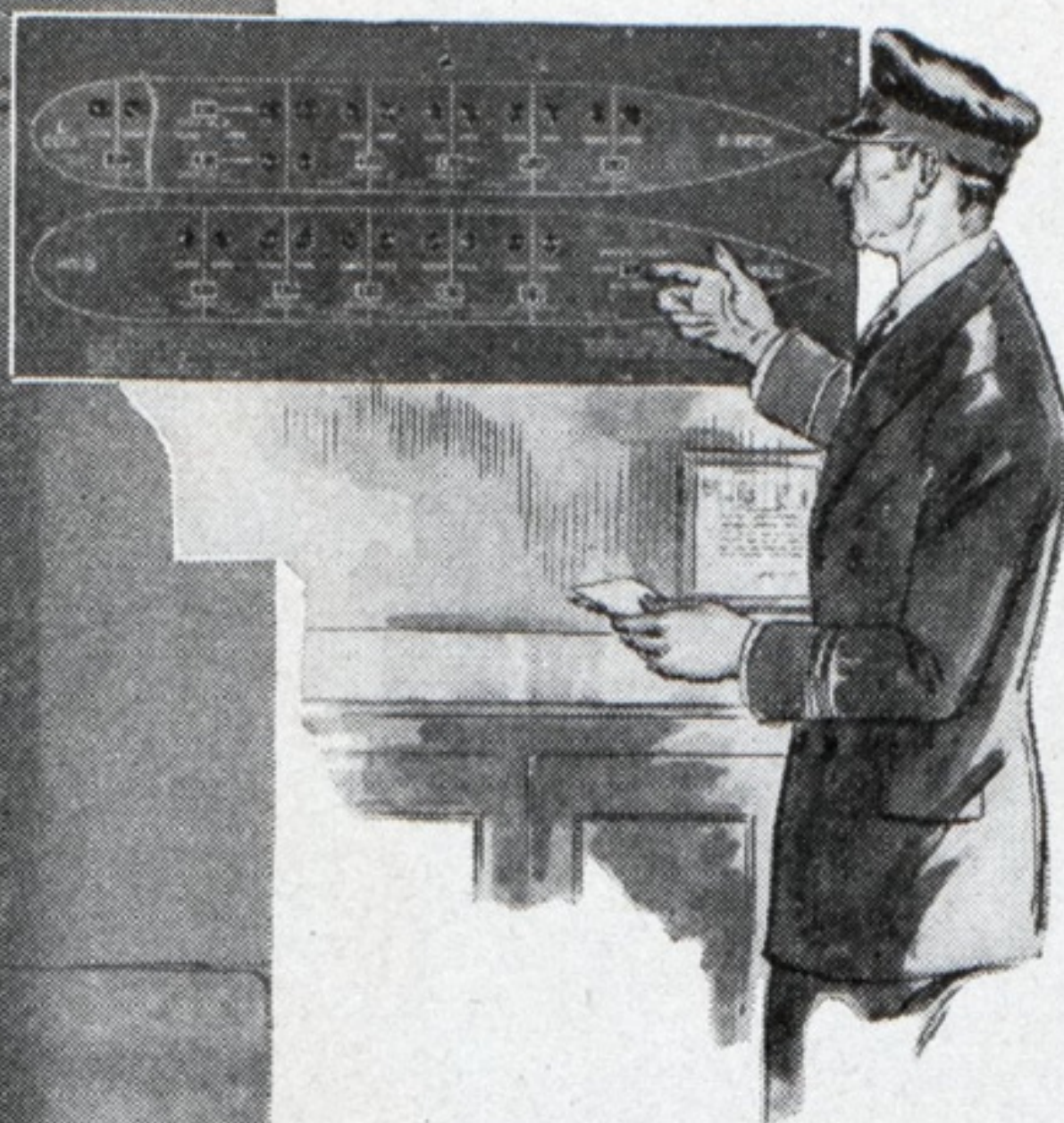
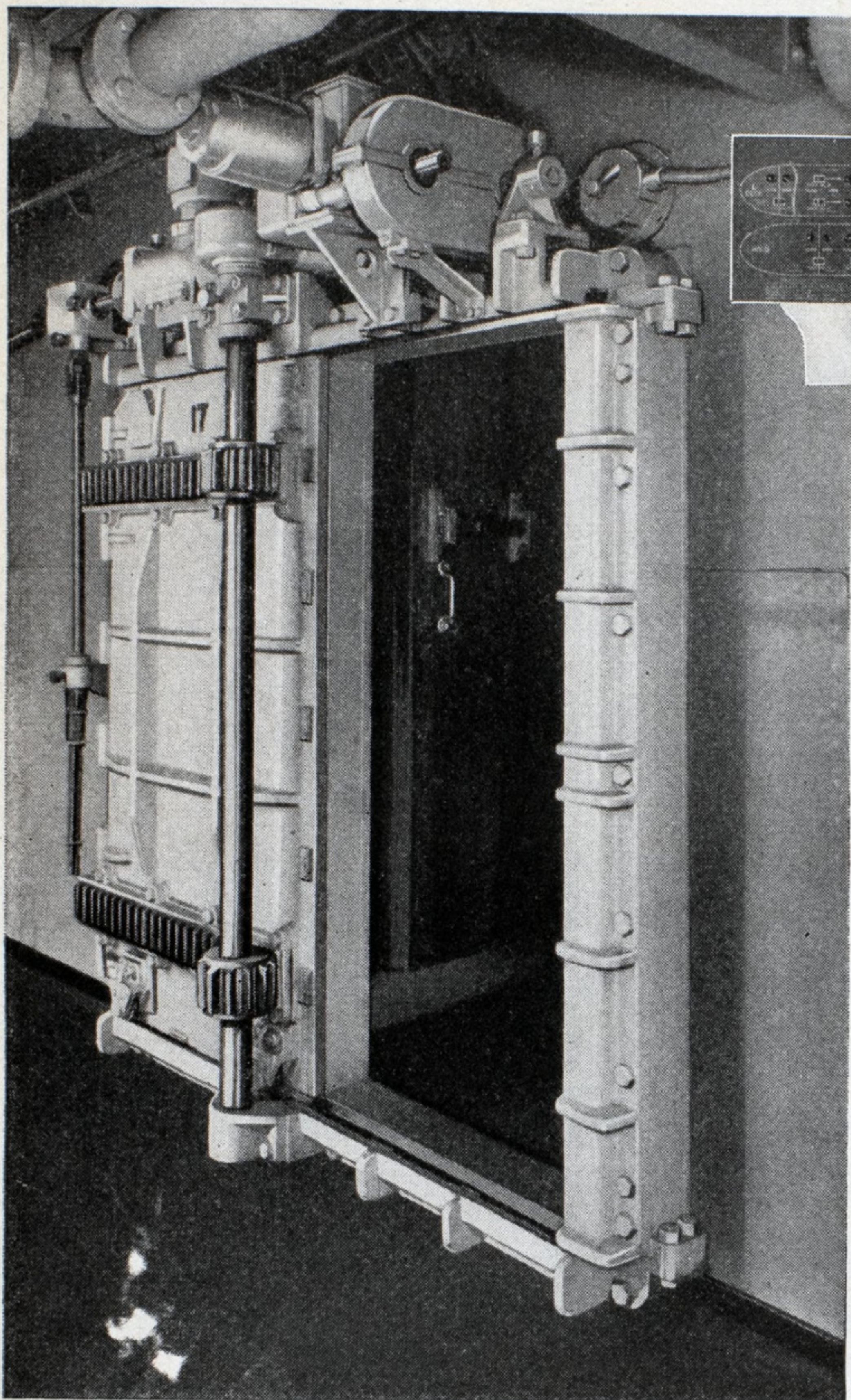
SUPERIOR  
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# DEPENDABLE DOOR CONTROL SAVES MANPOWER

when it may be  
needed most



WHEN every man is needed at his post and a sudden emergency demands the closing of bulkhead doors—then C-H Bulkhead Door Control steps in to save time, *save man-power*. Merely throwing a switch on the

master control panel in the pilot house closes every bulkhead door on board ship. Not a second is lost. Not a man must leave his post. C-H Bulkhead Door Control does all the work.

First a warning signal sounds at each bulkhead opening. A compact, high starting torque motor snaps on, makes one complete revolution before the door is started. The sharp impact frees the door. Lights flash the position of each door to the officer in the pilot house. Every door responds to his master control switch. But there are also two control stations at each door for local operation. When these are released the master switch reassumes control. C-H Bulkhead Door System also *permits and does not interfere with manual operation*.

The C-H Bulkhead Door Control System complies with all marine rules and regulations and meets every specification of the International Conference on Safety of Life at Sea. It is approved and used by world respected naval architects and shipbuilders.

Expert engineering aid is freely given in installing your C-H Bulkhead Door System. "Modern Watertight Door Control" is a C-H booklet sent on request.

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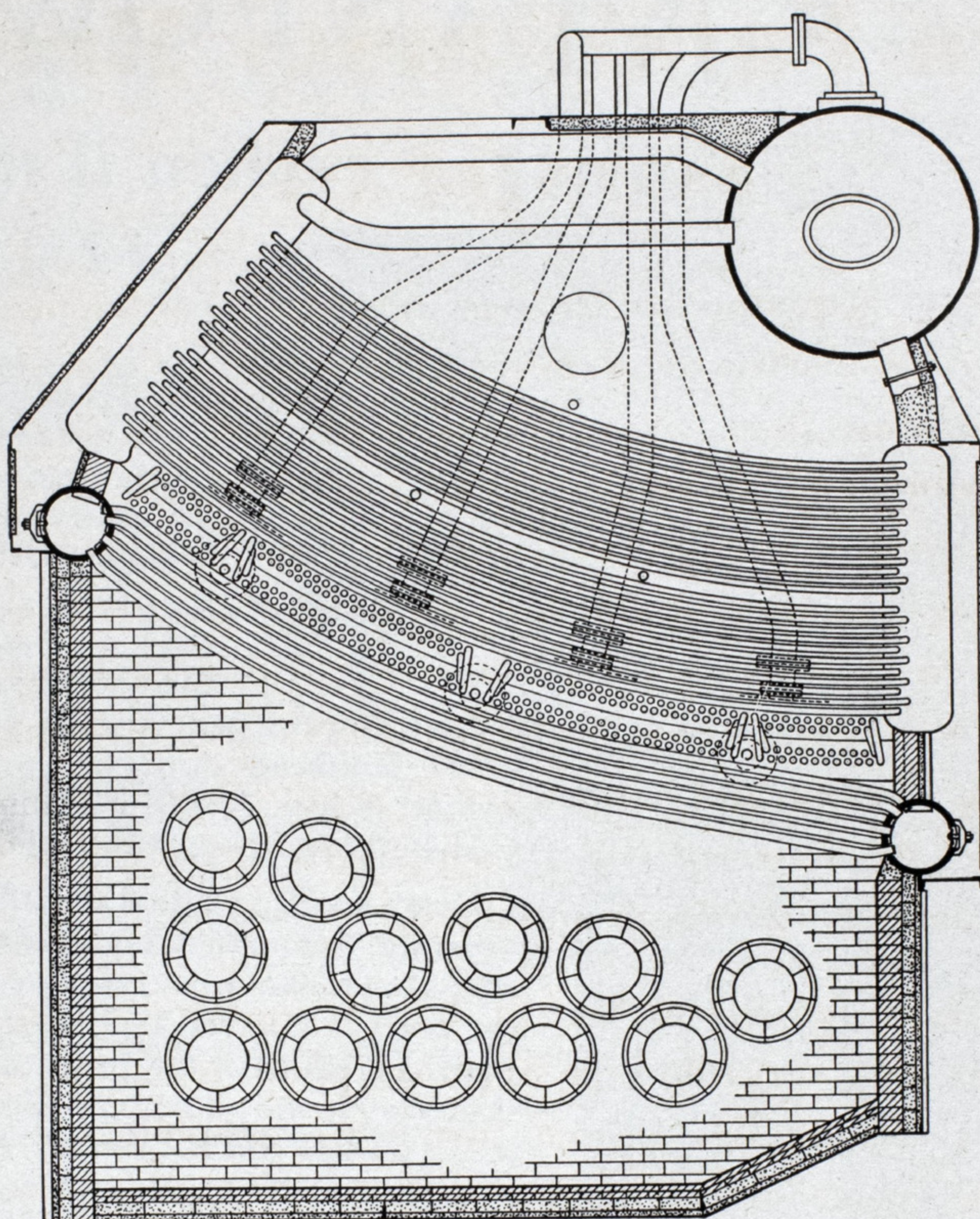


## Motor-Driven Bulkhead Door Operating Systems

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# Modern Steam



## *The Sectional Express Boiler*

The Babcock & Wilcox Sectional Express Boiler is a light weight, compact, and highly efficient unit designed to meet limitations of weight and space and the requirements of Modern Steam.

There are no untried mechanical features of construction. The sectional headers are modifications of those used in the well known Babcock & Wilcox boiler . . . set to provide a decreasing area of gas passage through the boiler resulting in a uniform high rate of heat transfer with stack

temperature so low as to economically eliminate the necessity of the air preheater to attain high overall efficiency. Tests of this type of boiler have shown efficiencies of 82.75% to 84.62% over a range of one pound to one quarter pound of oil per square foot of heating surface per hour.

Thirty boilers of this type are under construction for the new Scout Cruisers *Minneapolis*, *New Orleans*, and *Astoria* and for the Airplane Carrier *Ranger*

THE  
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**C**LOSE acquaintance brings increased confidence in Diesel-electric drive. Since its first taste of salt water, a little more than ten years ago, it has been sailing fast into more and greater fields of usefulness. To-day, its many good points are becoming increasingly evident to the large number of ship operators who are proving its merit on the basis of actual service. Most recent among these is the Mystic Steamship Company. Judgment based on the wisdom and experience of eighty-three years lies back of its choice of G-E Diesel-electric drive for its two new tugboats, the *Luna* and *Venus*.

Preference for Diesel-electric drive is founded on sound reason. As a versatile type of power plant, it has no competitor. Its flexible power turns the propeller at the correct speed for performing its task most efficiently. It also furnishes current for lighting, cooking, and numerous other tasks, both at sea and in port.

In addition to electric equipment for Diesel-electric drive, General Electric manufactures complete turbine propulsion machinery, motors and control for ships' auxiliaries, searchlights, and marine accessories of many kinds. General Electric Company, Schenectady, N. Y.

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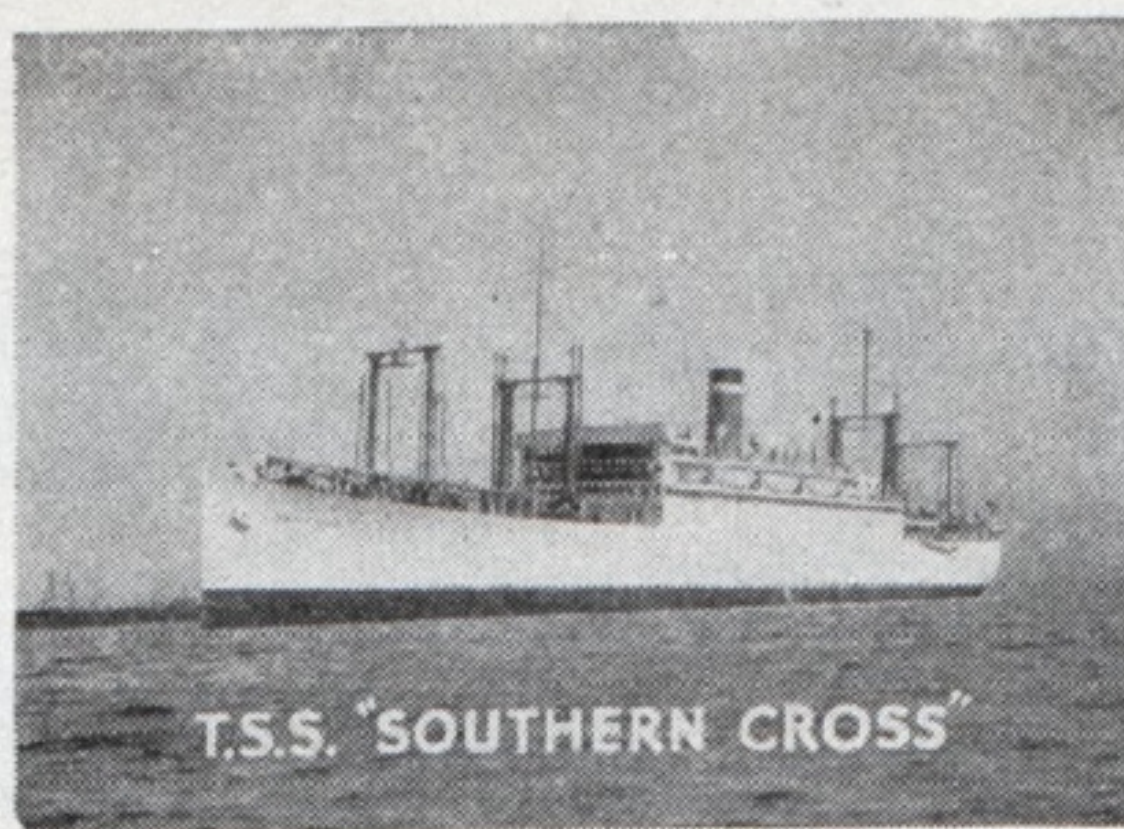
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# BUILT BY NEW YORK SHIPBUILDING COMPANY



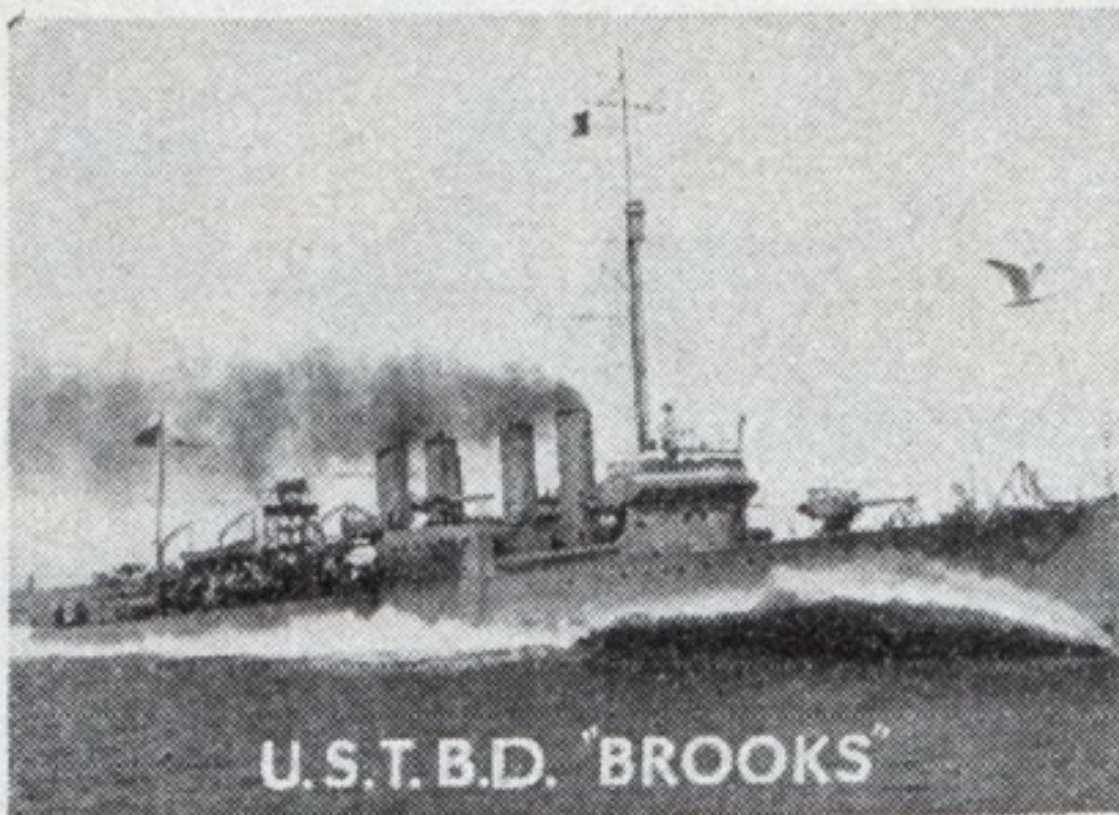
T.S.S. "MONGOLIA"



T.S.S. "SOUTHERN CROSS"



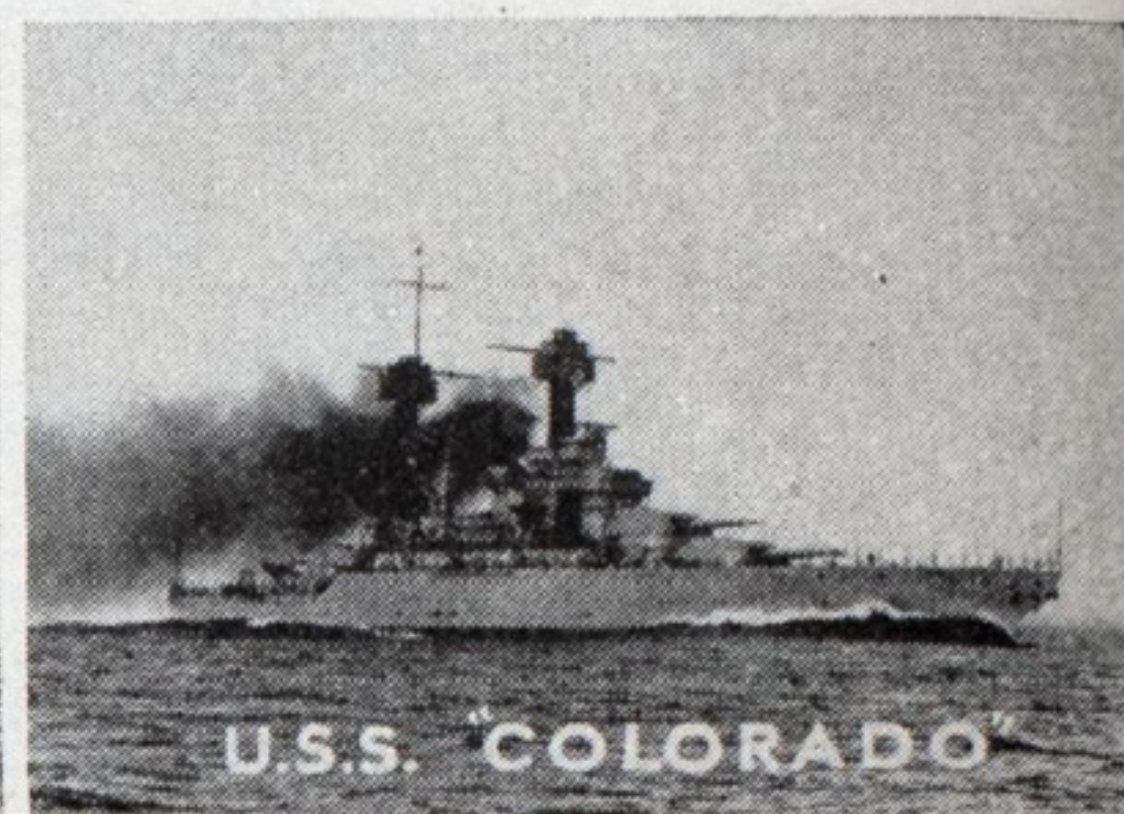
U.S.S. "SARATOGA"



U.S.T.B.D. "BROOKS"



U.S.S. "CHESTER"



U.S.S. "COLORADO"



S.S. "MUNARGO"

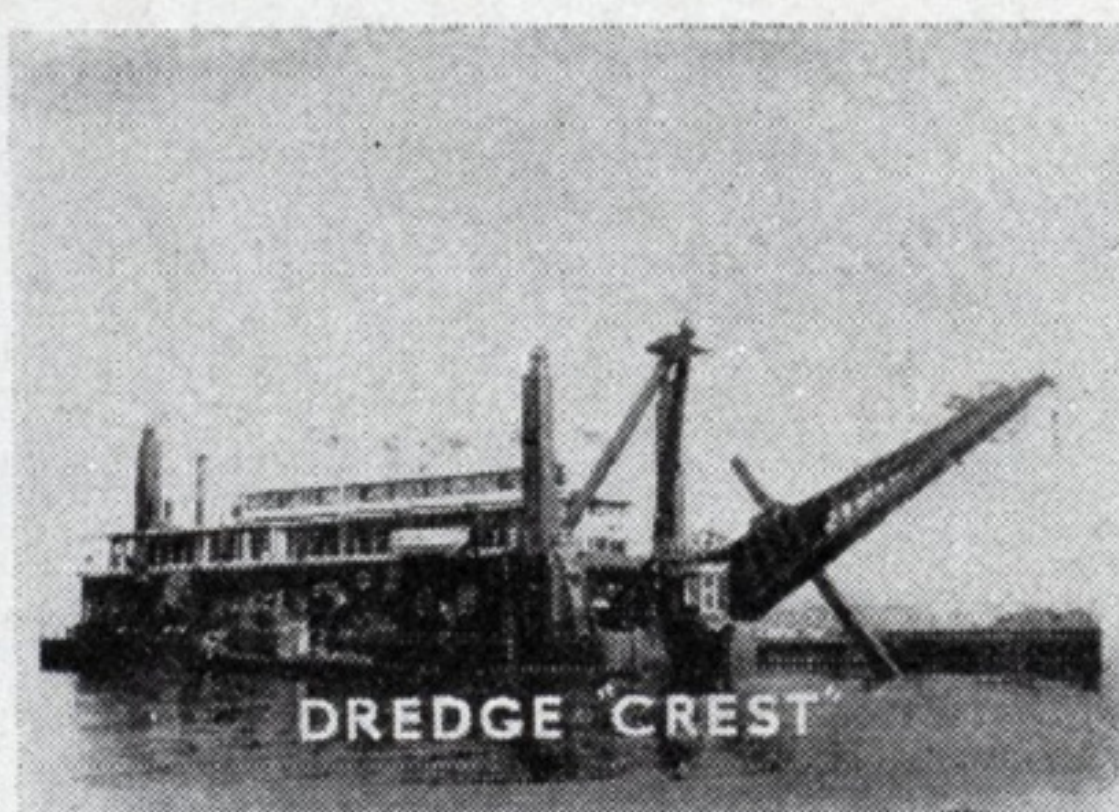
DESIGNERS *and* BUILDERS  
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FERRY BOAT "MAYOR GAYNOR"



DREDGE "CREST"



"WASHINGTON IRVING"



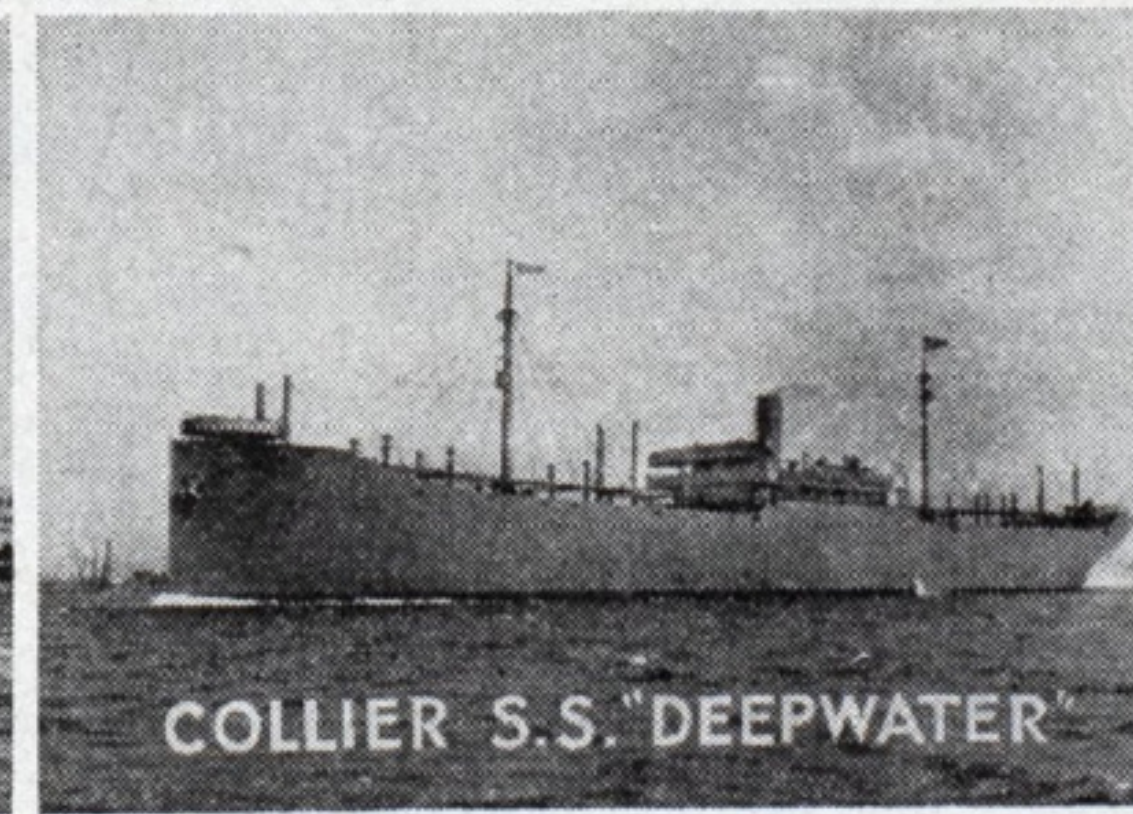
"GULFCREST"



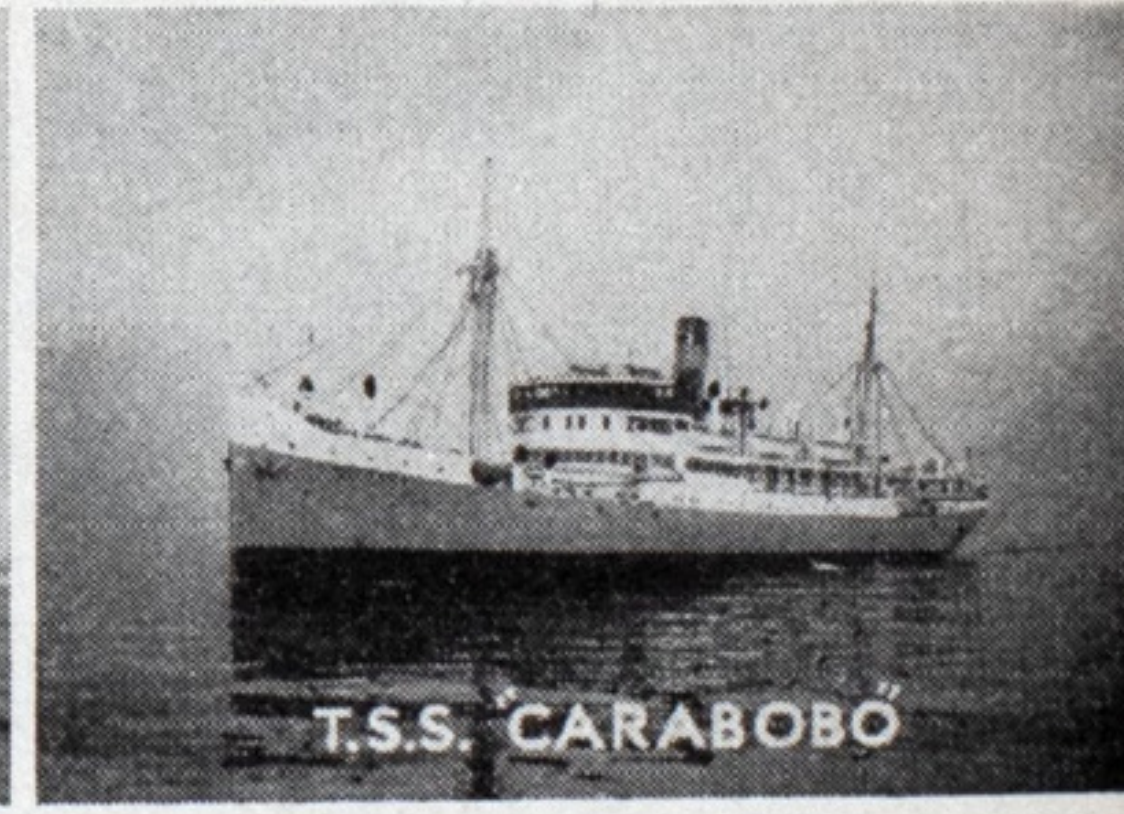
T.S.S. "SANTA CLARA"



T.S.S. "TEXAN"



COLLIER S.S. "DEEPWATER"



T.S.S. "CARABOBO"

The successful record of the ships that have been delivered by this yard in the past foreshadows operating efficiency, utility and long life in those vessels that we may be privileged to build in the future.

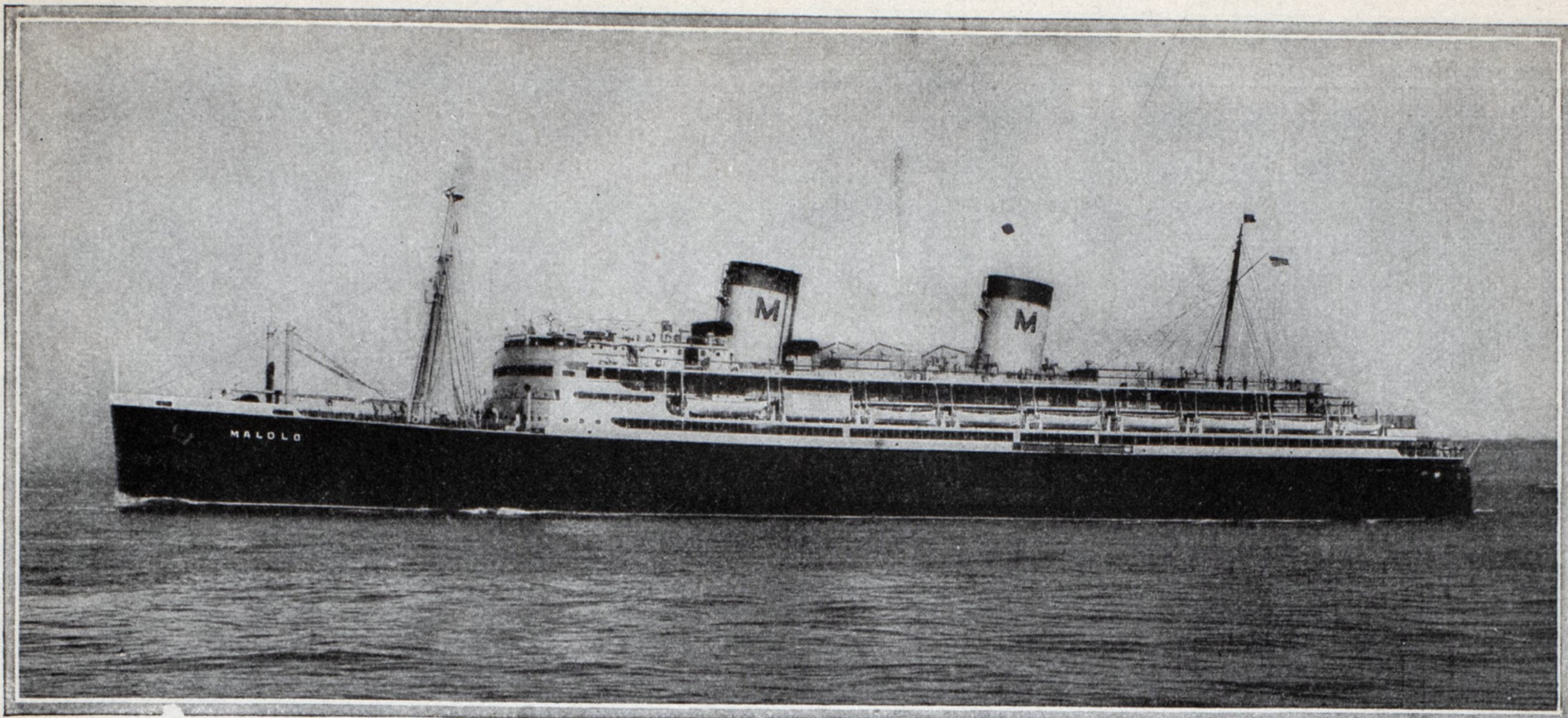
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## NEW YORK SHIPBUILDING CO.

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*Passengers now enjoying the Malolo's second Around Pacific Cruise are made comfortable in staterooms equipped with Simmons springs and mattresses.*

# *Luxury on the Malolo*

Simmons springs and mattresses  
make her staterooms restful

A NEW impetus was given Pacific travel with the advent of the great Malolo, flagship of the Matson Fleet. On the Hawaii run and as a cruise ship, her speed and luxury have brought her unbroken success.

Because her passengers expect much of the Malolo, the Matson Line was most careful in furnishing her staterooms. Her beds have Simmons Purple Label mattresses—the famous Beautyrest inner construction uphol-

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Such a combination means superlative comfort for the passenger and low upkeep cost for the operator.

We'd like to tell you more about Simmons installations without obligation to you. Perhaps we can help solve some of your problems of furnishing or renovation. Write to the Simmons Company, Contract Division, 666 Lake Shore Drive, Chicago, Illinois.



## SIMMONS

BEDS—SPRINGS—MATTRESSES—METAL FURNITURE AND BERKEY & GAY FURNITURE



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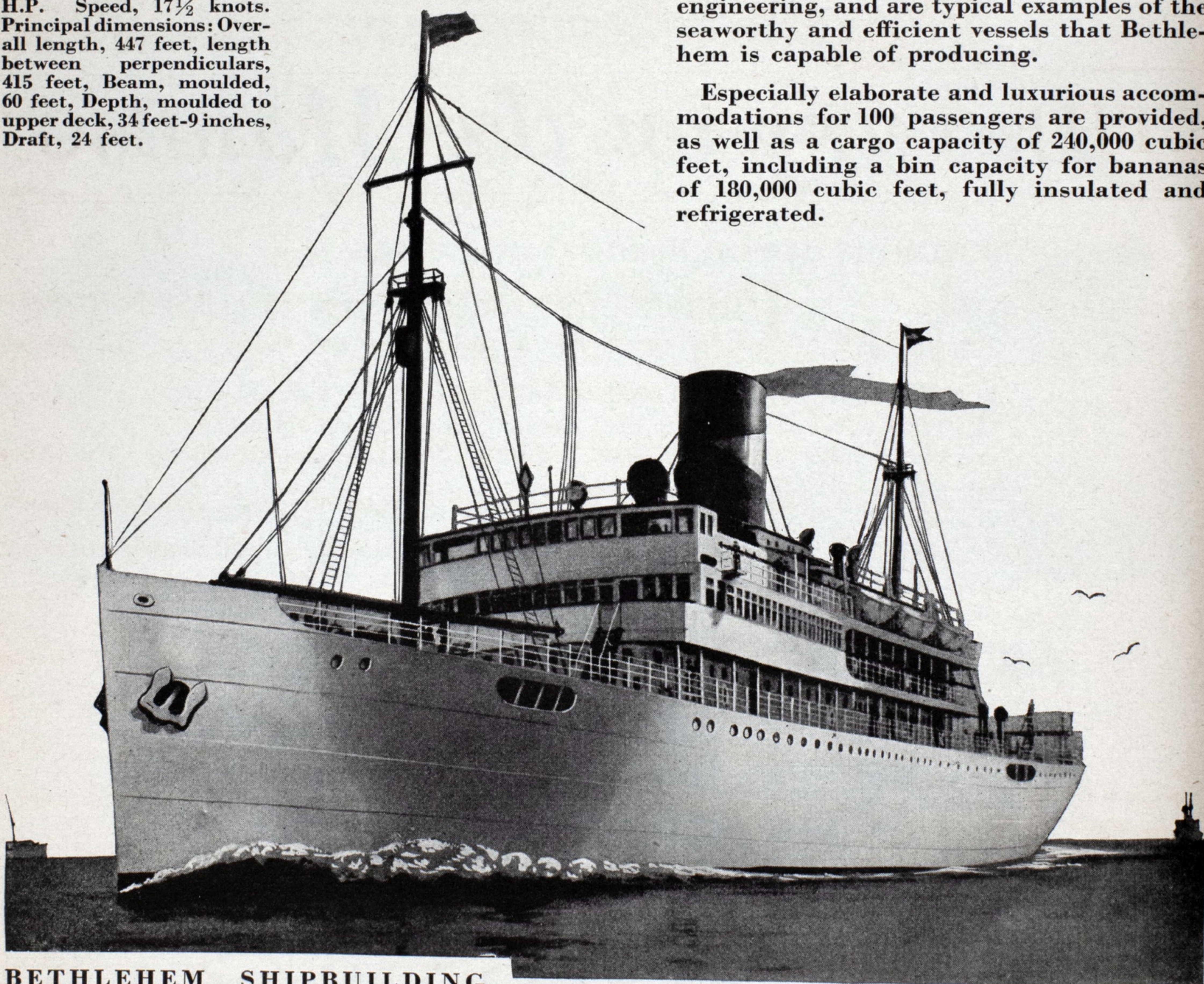
# Building 3 New Liners for the GREAT WHITE FLEET

Three large passenger and cargo steamers now under construction at Bethlehem's Fore River Plant for the United Mail Steamship Co., will be notable additions to the Great White Fleet.

These liners incorporate the latest improvements in ship design and marine engineering, and are typical examples of the seaworthy and efficient vessels that Bethlehem is capable of producing.

Especially elaborate and luxurious accommodations for 100 passengers are provided, as well as a cargo capacity of 240,000 cubic feet, including a bin capacity for bananas of 180,000 cubic feet, fully insulated and refrigerated.

The new White Fleet liners will be driven by turbo-electric machinery capable of developing 10,500 H.P. Speed, 17½ knots. Principal dimensions: Overall length, 447 feet, length between perpendiculars, 415 feet, Beam, moulded, 60 feet, Depth, moulded to upper deck, 34 feet-9 inches, Draft, 24 feet.



**BETHLEHEM SHIPBUILDING CORPORATION, Ltd., Bethlehem, Pa.**

*General Sales Offices*

New York

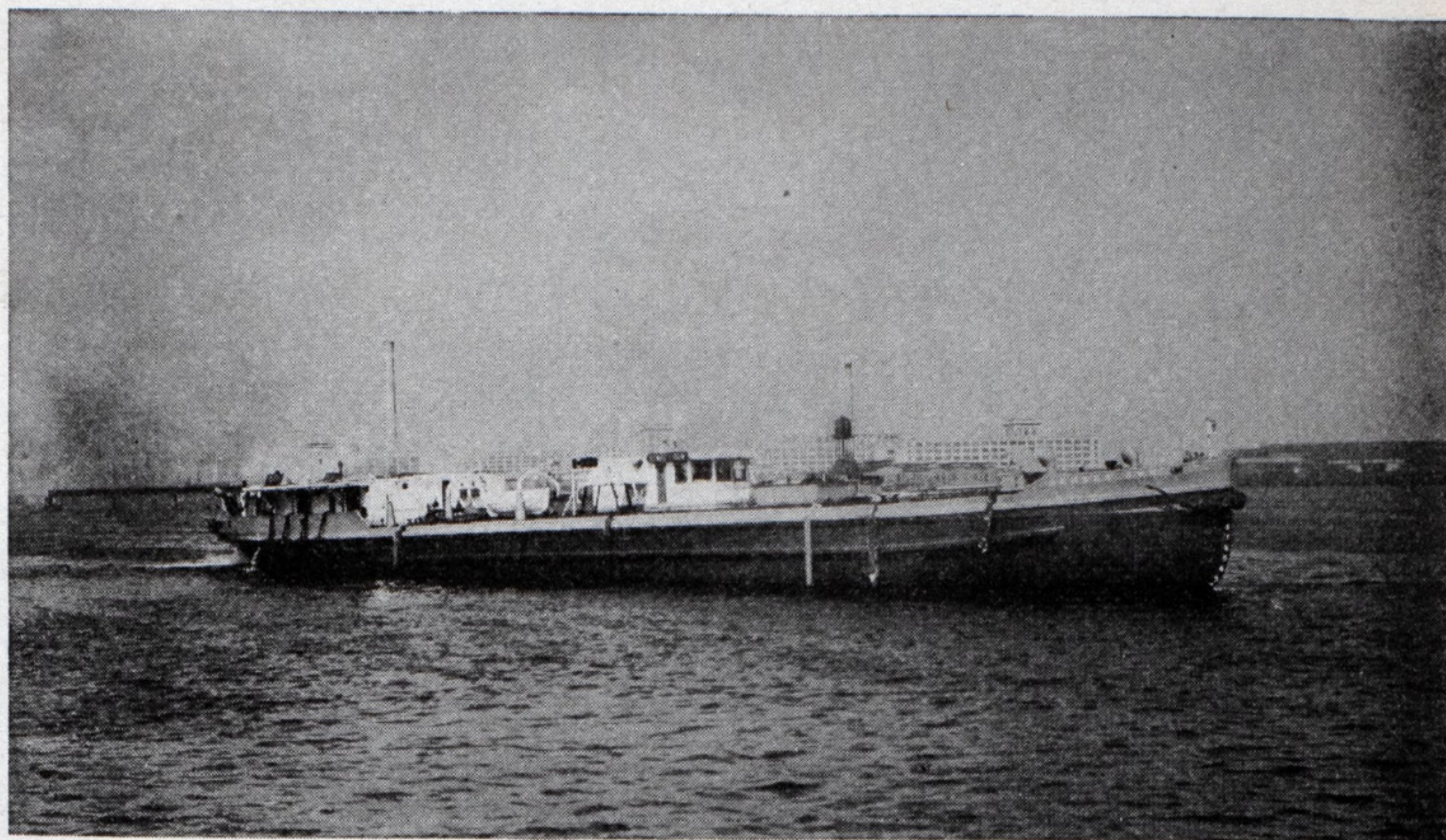
San Francisco

District Offices in Boston, Baltimore and San Pedro

# BETHLEHEM



*The "Cayuga Sun", small Diesel electric oil tanker of The Sun Oil Company, designed especially for service on the Great Lakes, rivers, and the New York State Barge Canal.*

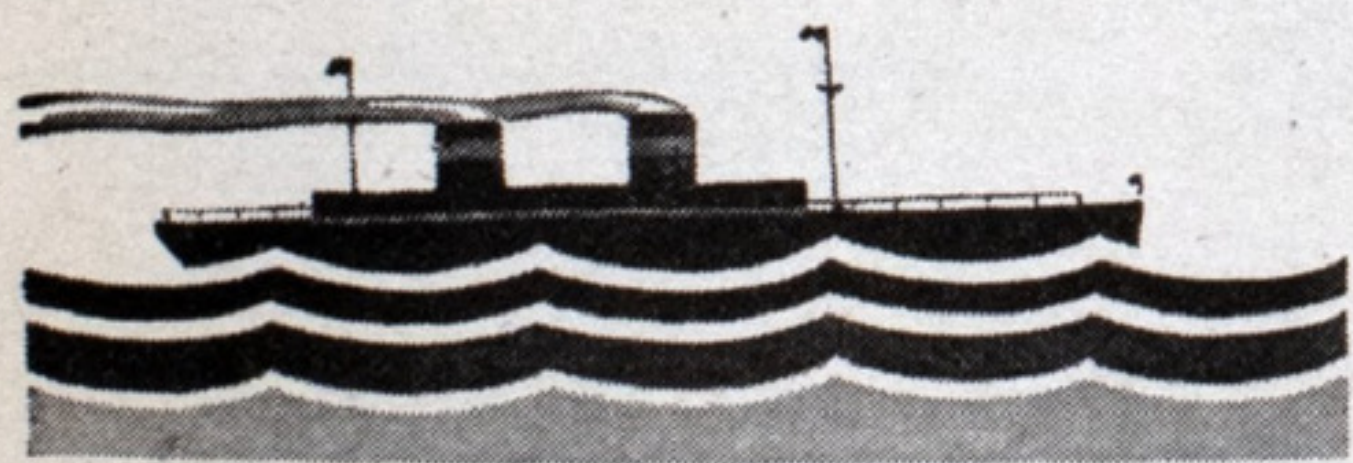


## "THE TANKERS ARE COMING"

**I**N the old days, the sound of a chime whistle around a river bend was answered by the shout from the wharfboat, "Steamboat Coming!"

Now trim little tankers, Diesel electric driven, are rounding the bends of the inland waterways with golden cargoes, ushering in a new and efficient means of transportation for the oil industry.

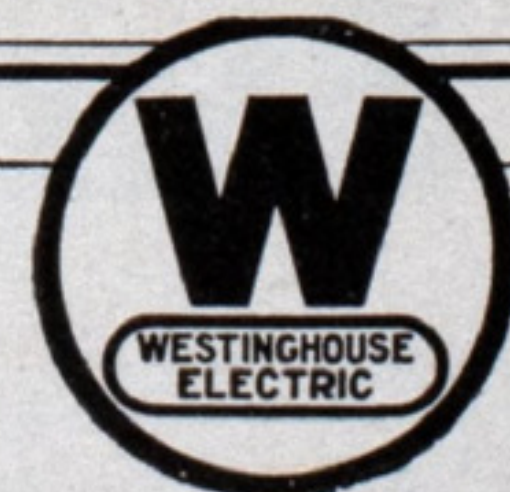
Westinghouse has designed and manufactured the electrical equipment for several of these tankers. Diesel electric drive gives them the advantages of ease of maneuvering and the economical generation and flexible distribution of the large auxiliary load required for this type of cargo carrier.



*Service, prompt and efficient in all principal American ports*

# Westinghouse

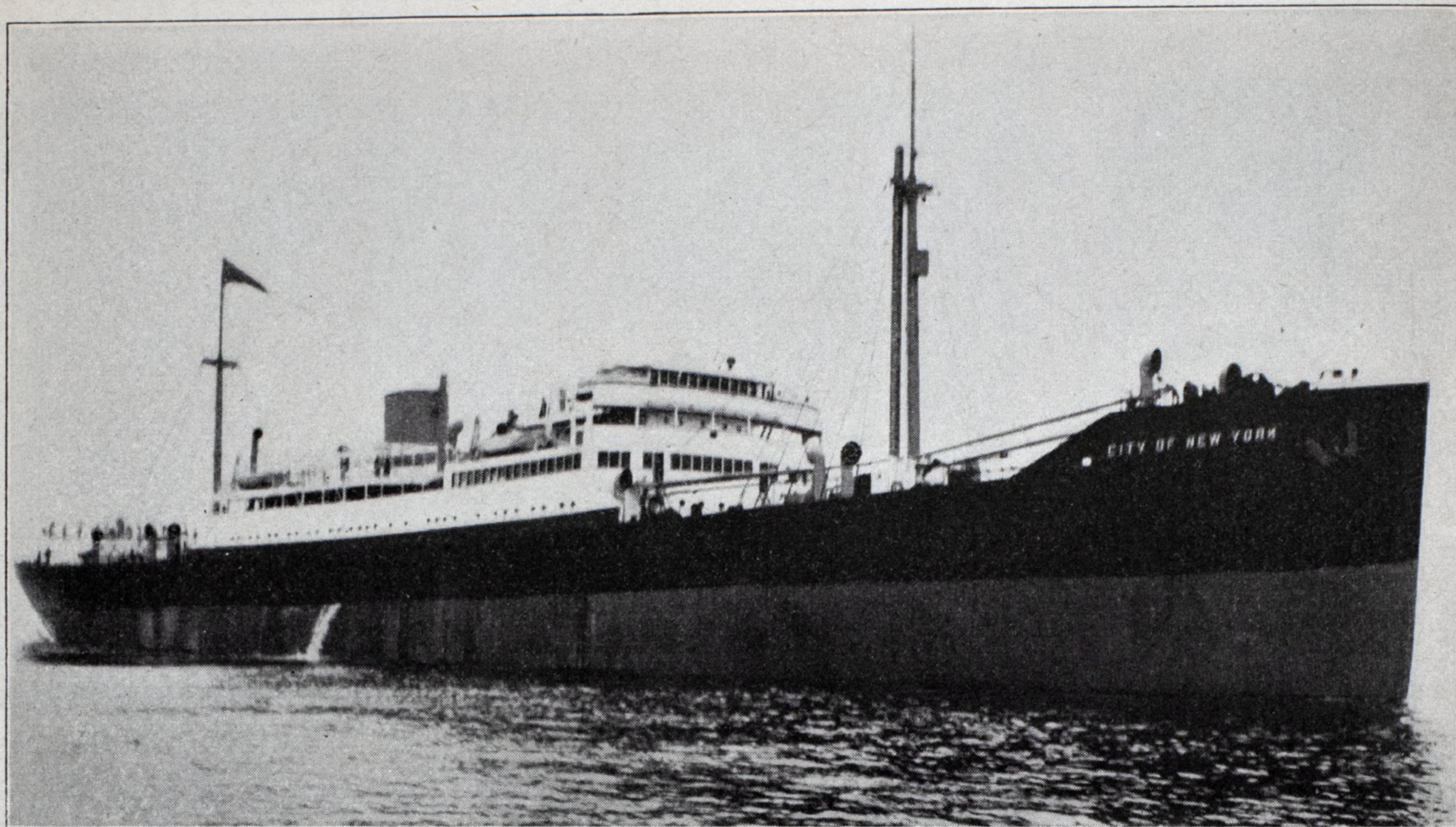
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TUNE IN THE WESTINGHOUSE SALUTE OVER THE N. B. C. NATION-WIDE NETWORK EVERY TUESDAY EVENING.



# Driven by Sun-Doxford Engines



## Motor Vessels & Engines Built at SUN Yard

### MOTORSHIPS

(Passenger and Cargo)	h.p.	d.w.t.
Benson Ford .....	3,000	12,000
Challenger .....	3,000	11,600
City of New York (twin screw) .....	5,400	9,350
East Indian (twin screw) ..	5,000	11,600
Henry Ford II .....	3,300	12,000
Twin Screw Yacht Sialia ...	1,500	

### MOTORTANKERS

	h.p.	d.w.t.
Aurora .....	3,000	10,200
Australian (twin screw) ...	5,000	17,120
Bidwell .....	3,000	10,200
Chester Sun .....	2,800	13,452
Eastern Sun .....	3,000	13,500
Gulf of Venezuela .....	3,000	10,200
Pacific Sun .....	3,000	13,500
Sun .....	3,000	13,500
Sunoil .....	3,000	13,500
Tide Water .....	3,000	13,800
Tide Water Associated .....	3,000	13,800
Western Sun .....	3,000	13,500

*Builders of*

## Passenger and Cargo Vessels—Oil Tankers

*Unlimited facilities for*

## MARINE REPAIRS

*Two floating Dry Docks*

*11,000 Tons Lifting Capacity Each*



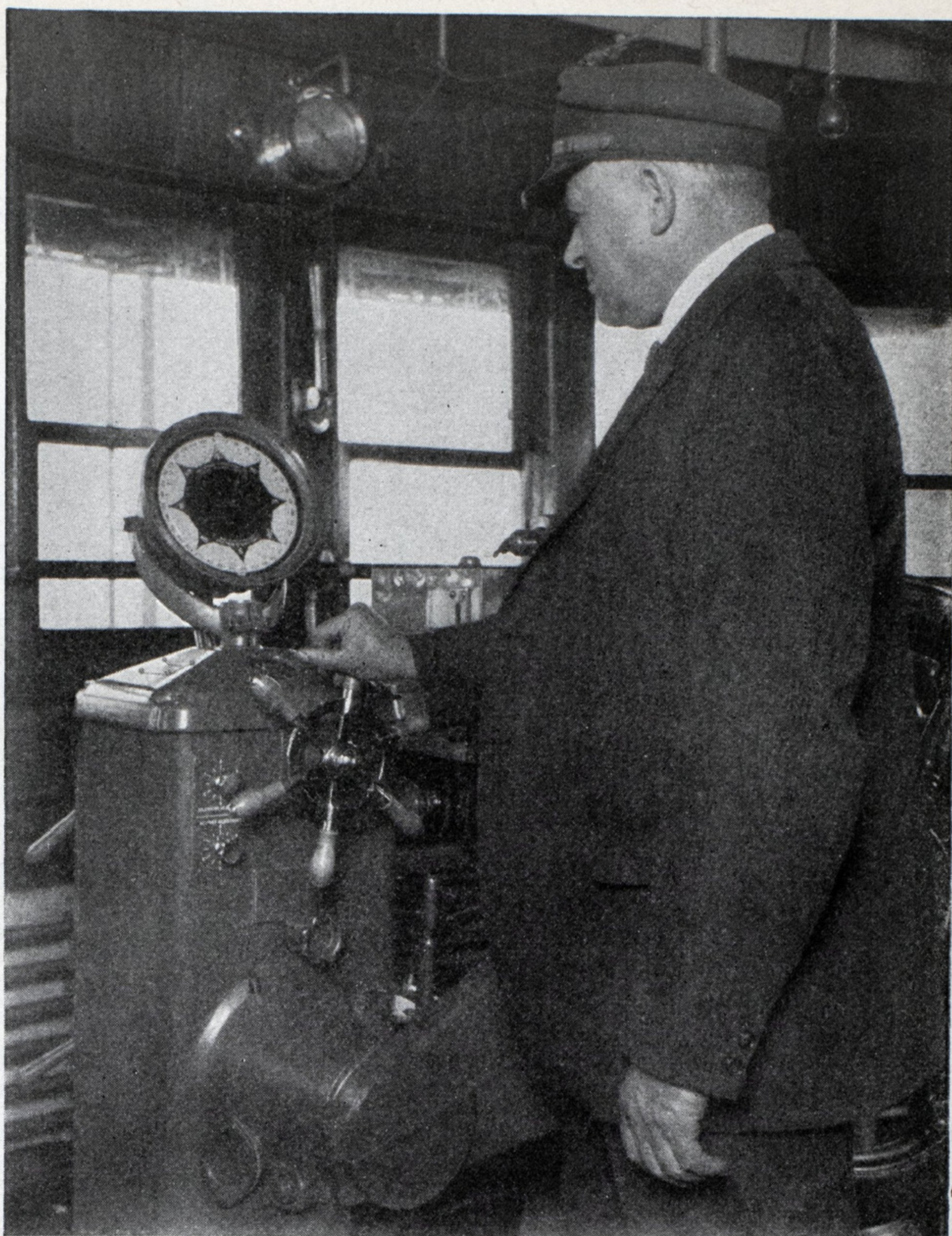
# SUN SHIPBUILDING & DRY DOCK COMPANY

Shipyard & Main Office  
CHESTER, PA.

25 Broadway  
NEW YORK



*In*  
*Navigating*  
*Efficiency*



## the Old Ship Can be Made Equal to New

**M**ANY progressive ship operators are equipping their older ships, as well as the new, with Sperry Gyro-Compasses. By this relatively small investment they can make the older ship equal to the new in navigating efficiency.

¶ Competition is keen these days. That is why the wide awake, progressive companies have fitted and are fitting their older ships with the Sperry Gyro-Compass and Gyro-Pilot.

¶ We will be glad to have our engineers inspect your ships and estimate the cost of providing them with this up-to-date navigational equipment.

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BROOKLYN, NEW YORK

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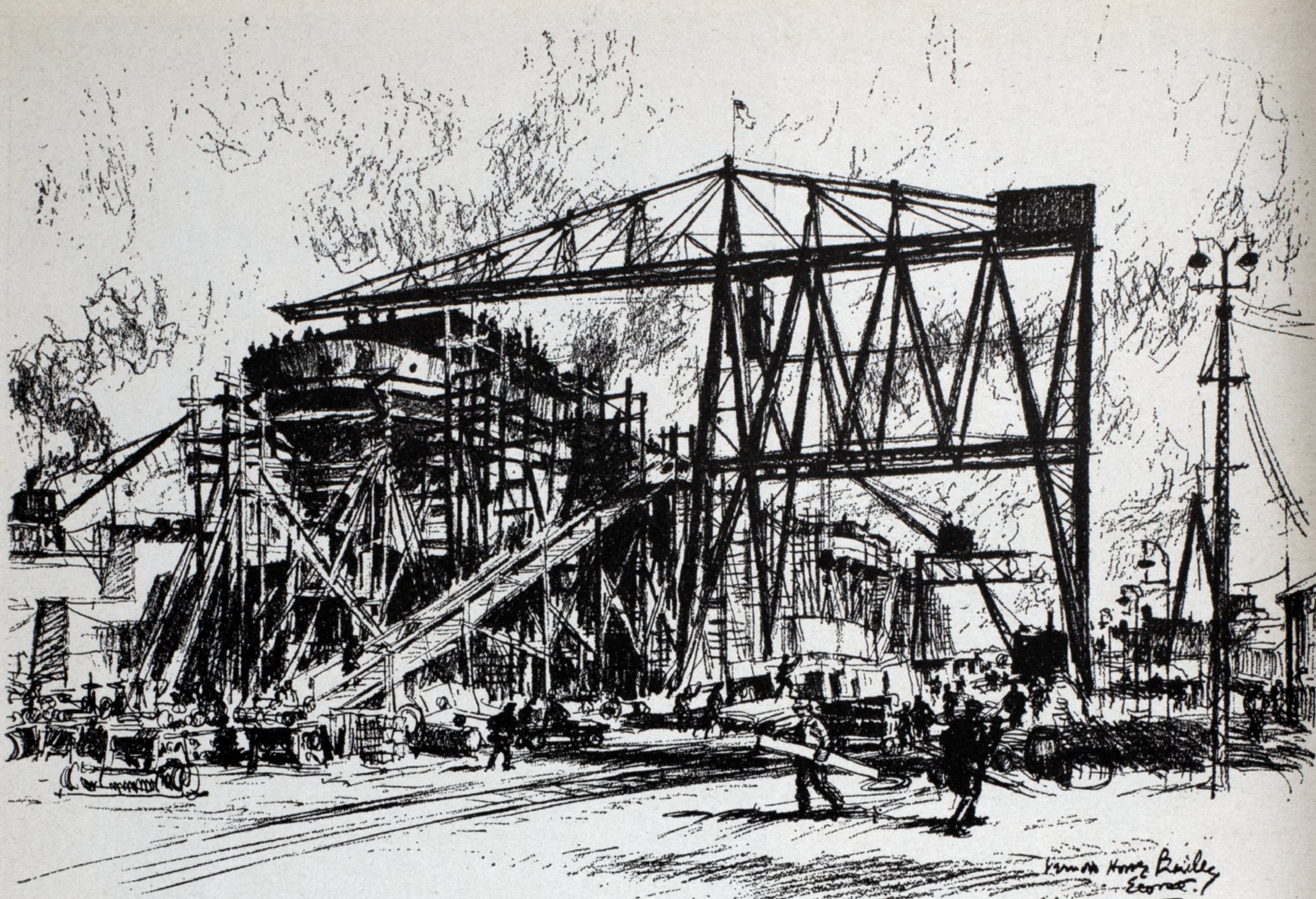
LOS ANGELES  
236 Avalon Blvd., Wilmington

SAN FRANCISCO  
58 Main Street

SEATTLE  
2737 1st Avenue, South







Great Lakes Hull under construction at our River Rouge Yard. From an etching by Vernon Howe Bailey.

*Hull construction*

# HIGHEST STANDARDS

of workmanship, engineering and service are ever apparent in Great Lakes built ships and engines—and repairs.

## GREAT LAKES ENGINEERING WORKS

Shipbuilders and Engineers

General Offices

River Rouge, Michigan

Cleveland Office: Union Trust Bldg.

Engine Works Equipped  
For General Heavy  
Machine and Foundry  
Work

Detroit, Michigan

Complete Shipbuilding  
Dry Dock and Repair  
Facilities

River Rouge, Mich., and  
Ashtabula, Ohio



...the ship tests which have extended over a period of nine months, Nelseco is prepared to make deliveries of a newly designed 1200 h.p. Diesel which has been developed for use in Diesel-electric installations.

The moderate weight and compact design of this new Nelseco model enable it to be used in connection with electric drive at the sacrifice of no more space than is required by large slow-speed direct-connected engines. Furthermore, the first cost of such a Diesel-electric installation is practically no greater, even though the electrical apparatus is included.

Advantages of Diesel-electric over direct drive are well known, a few of which are: Greater reliability at sea; less time lost in port, as repairs may be made at sea without appreciably affecting ship's speed; most

house control; use of one main engine for carrying auxiliary loads in port; saving of cargo space due to elimination of shaft alley.

Type 6 MI-53, 6-cylinder, 4-cycle, mechanical injection Nelseco Marine Diesel Engine, developing 1000-1200 b.h.p. at 250-300 r.p.m., incorporates the soundest and most modern principles of design which have been developed by an organization outstanding in its field for many years. It will be found flexible and reliable in performance, and economical both in first cost and in operation. We shall be glad to send you complete information about this or any other model. (The range of Nelseco Diesel Engines includes types for tow-boats, yachts, passenger, freight and fishing vessels of all descriptions.) Write for Catalog M-1.

**ELECTRIC BOAT COMPANY**  
NEW LONDON SHIP AND ENGINE WORKS, GROTON, CONN., U. S. A.  
*New York Sales Office: 247 Park Avenue, New York City*

# NELSECO

Original licensees from and collaborators with M. A. N. since 1910

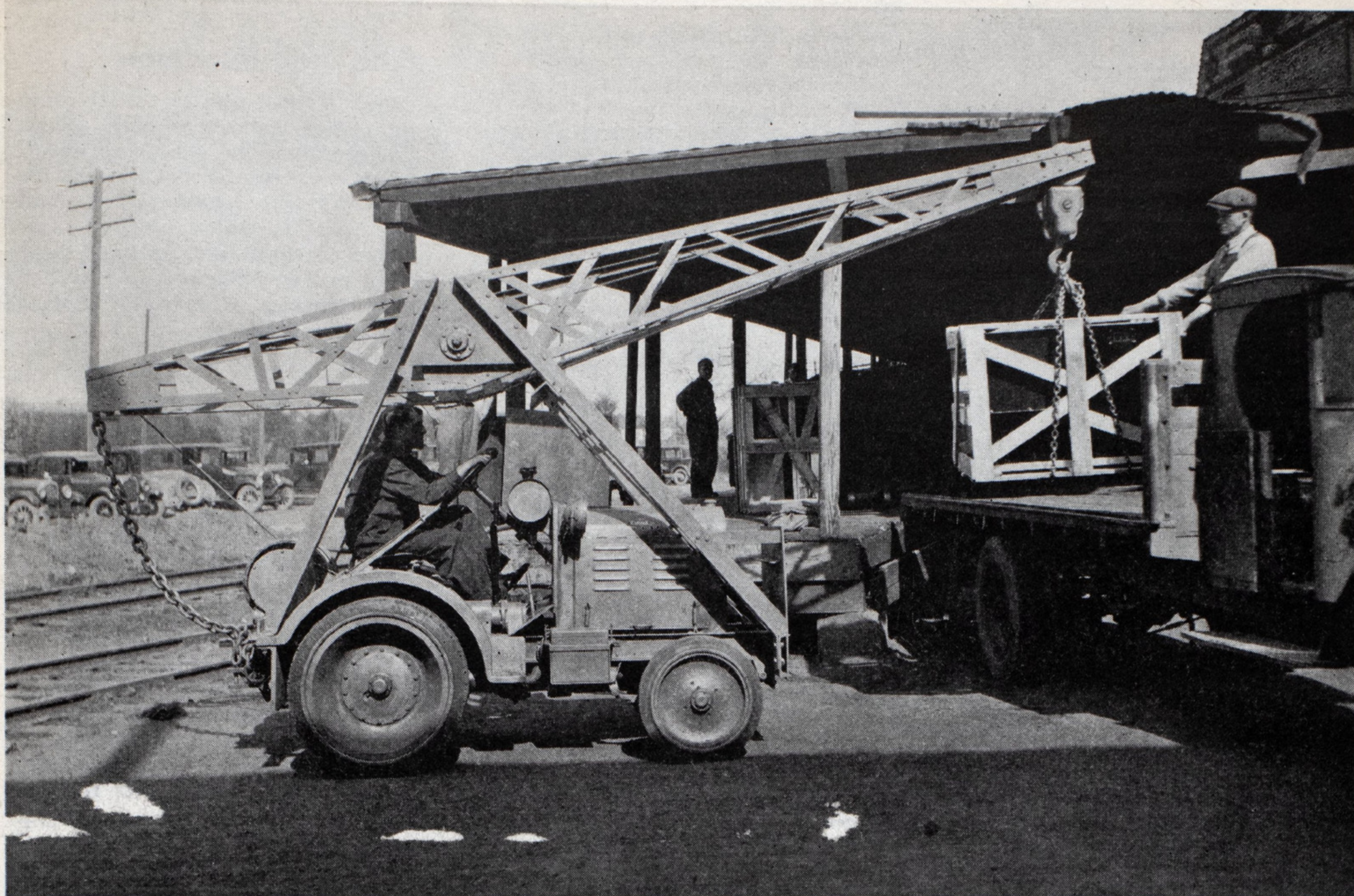
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126 State Street, Boston, Mass.

West Coast Representative  
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*Operator controls lifting, lowering and neutral with one lever. Load may be held in any position.*

# “Clarktor” Crane

*stoops to get through doorways*

A mobile crane of variable height and capacity, with a reach enabling it to tier 4000 lbs. to 13 ft., yet, with boom horizontal, has an overall height of only 7 ft. 10 in. A busy, lifting, carrying, tiering rig for dock and pier service, so compact that it passes through warehouse doorways easily.

Built on the sturdy “Clarktor” chassis, this boom crane has dual rear tires, self-starter, generator and headlights. Drum handles 500 ft. of  $\frac{1}{2}$  in. cable, making the outfit serviceable as a power winch. Ideal for handling bulky, heavy cargo that requires hooks or chains. Useful also in shipyards and machine shops.

## Special Note!

Clark vehicles are gas-powered—therefore competent for 24 hour continuous service and just as potent the last hour as the first.

**Clark 24-hr. continuous service**

**Ordinary 8-hr. service**

## Write for new bulletin

Ship operators, stevedoring organizations and shipbuilders will be interested in a new bulletin just issued, describing “Clarktor” Boom Crane in detail.

**The Clark Trutractor Co.**

Battle Creek, Mich.

Attach this  
ADVERTISEMENT  
to your inquiry



# Your biggest chance for increased profits this year

**B**EFORE carrying out plans for securing increased business this year, why not make a greater profit on the business you already have? Review your ship operating expenses for 1930. If your business is near-average, your expenses were divided about as follows:

Cargo Handling.....	30%
Wages of Crews and Officers.....	16%
Fuel.....	13%
Repairs and Maintenance.....	4%
Stores.....	2%
Commissary.....	2%
Port Dues.....	4%
Canal Tolls.....	7%
Other Insurance, Claims.....	2%
Cargo Insurance.....	3%
Taxes, Depreciation.....	6%
General Overhead.....	11%
<b>Total.....</b>	<b>100%*</b>

Most of your expenses are fixed or offer only a limited chance for reduction. But *cargo handling*, the head that stands the highest, is the most easily driven down.

Because such tremendous savings can be made



How bales of paper pulp are handled at a Pacific coast terminal. Can you visualize the time and cost of performing this operation by hand?



An Elwell-Parker saves construction of new loading platform. Pictured is the "truck of all work" — the fork type — developed and perfected by Elwell-Parker. Notice the narrow turning platform

in cargo handling, it undoubtedly offers you your biggest chance for increased profits this year. In the case quoted, a 20% reduction in cargo handling means an increased profit of 7 to 8%. To make the same profit, through increased revenue, you would need to increase the cargo carried by 20%.

Elwell-Parker Electric Trucks offer you a mobile, flexible means of reducing your handling costs. Nearly every commodity that passes through your terminals can be handled faster and at lower cost by these remarkable machines. A man with an Elwell-Parker moves 2000, 5000 or even 6000 pounds per trip with practically no effort. Danger of accident is reduced and he is worth more because his productivity is increased.

Why not get the details now? A short note will bring an Elwell-Parker Field Engineer to your office—ready to explain and offer suggestions. Address your nearest office—or Elwell-Parker, Cleveland.

*\*Figures Reprinted from Marine Review.*

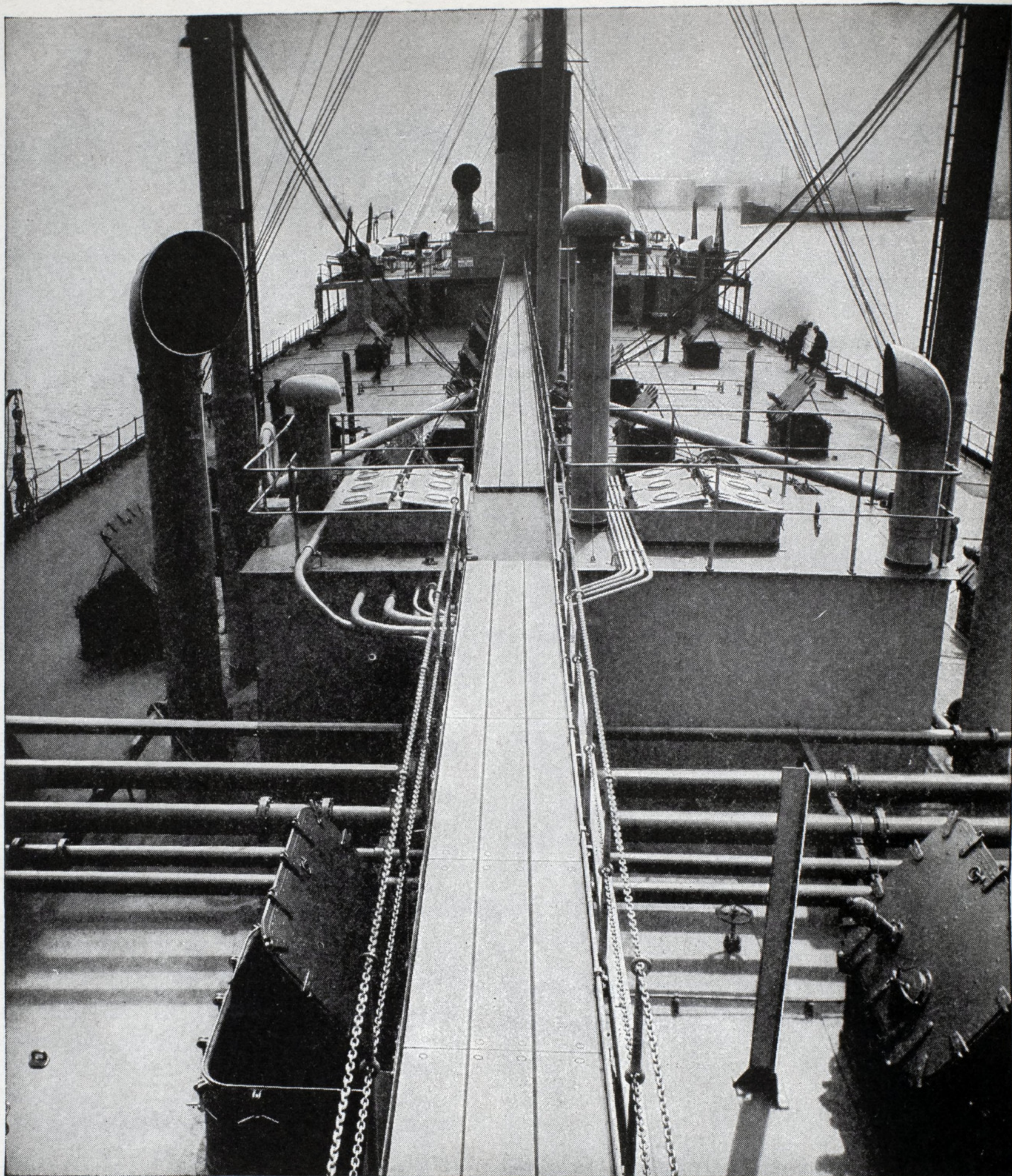
THE ELWELL-PARKER ELECTRIC COMPANY, 4200 ST. CLAIR AVENUE, **[SHIP on SKIDS]** CLEVELAND, OHIO

*\*Low center of gravity is a notable Elwell-Parker feature. It assures greater stability on curve, level or incline, and permits placing the operator nearer the load, giving him a clear and unobstructed view ahead. This makes for greater safety.*

## Elwell-Parker

Designers and Builders of Electric Industrial Trucks, Tractors and Cranes for a Quarter Century





# TANKERS

...more than other ships, are dependent for success on the quality of workmanship built into their steel hulls...Strains from deep loading and from operating in ballast impose unusual requirements on the steel structure...Experience in designing and satisfactorily meeting the exacting requirements of some of the largest oil companies, enables Federal to offer tankers built with the one ideal in mind...STEEL WORKMANSHIP OF SUPERIOR QUALITY.

**FEDERAL SHIPBUILDING AND DRY DOCK COMPANY**  
**GENERAL OFFICES AND WORKS: LINCOLN HIGHWAY, KEARNY, NEW JERSEY**  
**SUBSIDIARY OF UNITED STATES STEEL CORPORATION**



# SAVE IN PRODUCTION COST with better material-handling

*Electric Industrial Trucks  
equipped with Exide-Ironclad  
Batteries save money*

**I**N the handling of material, industry today has a great opportunity to reduce production costs and increase net profits. This can be accomplished by using electric industrial trucks equipped with Exide-Ironclad Batteries.

Electric industrial trucks move material with speed, efficiency and economy. When

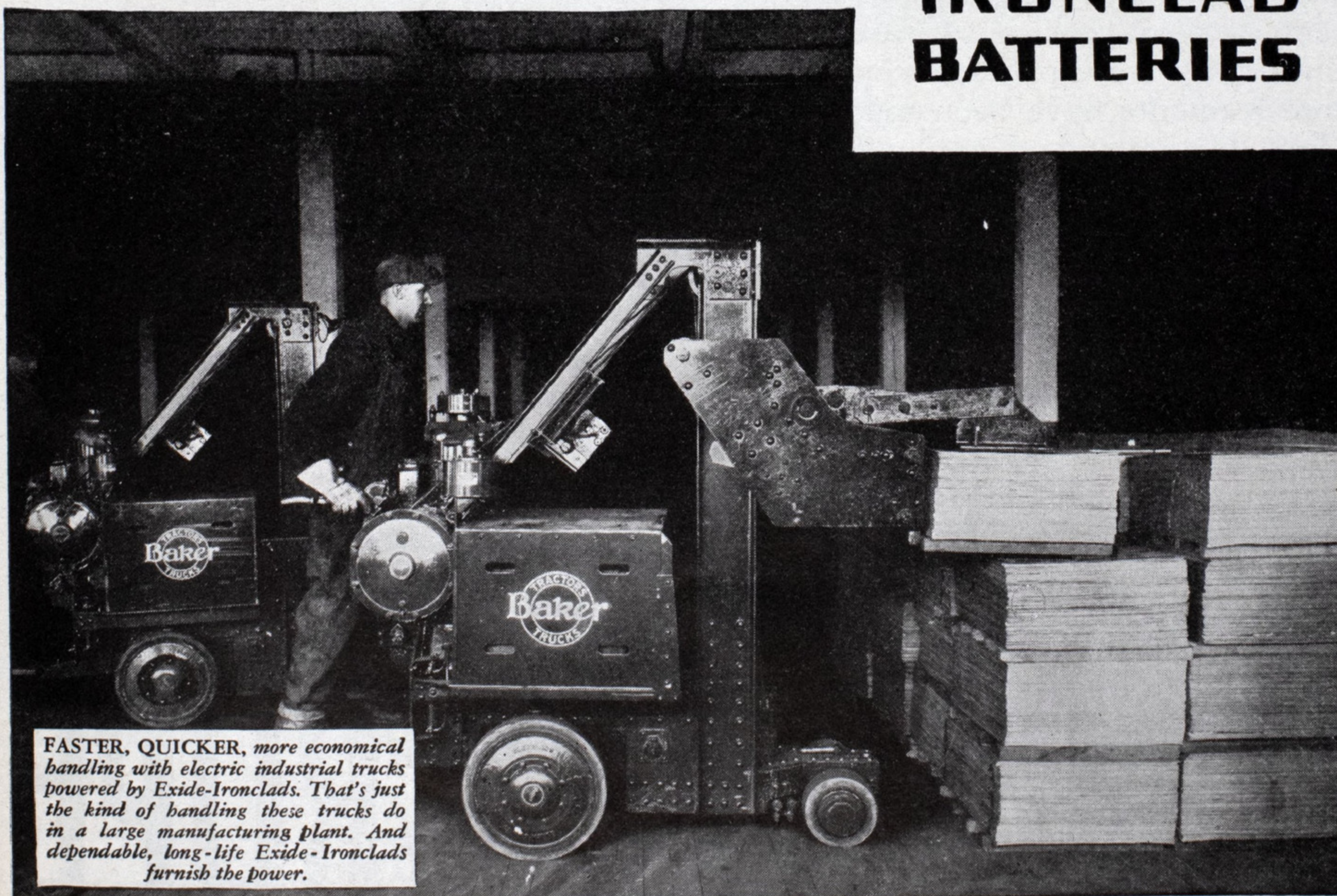
powered with Exide-Ironclad Batteries they not only maintain a good speed throughout the entire day's operation, but do it at the lowest possible cost.

Exide-Ironclad Batteries are entirely different from all others. Their rugged construction, the result of 43 years of specialized manufacturing experience, enables them to deliver years of day-in and day-out service with minimum care and attention. They are long-lived, powerful, and economical at the charging panel.

Investigate electric industrial trucks and Exide-Ironclad Batteries for your material-handling job. Write for Bulletin 160-R.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia  
The World's Largest Manufacturers of Storage Batteries for Every Purpose  
*Exide Batteries of Canada, Limited, Toronto*

## Exide IRONCLAD BATTERIES



*FASTER, QUICKER, more economical handling with electric industrial trucks powered by Exide-Ironclads. That's just the kind of handling these trucks do in a large manufacturing plant. And dependable, long-life Exide-Ironclads furnish the power.*



# WATERPROOFED



## Snow and Ice Do Not Injure Columbian Waterproofed Rope

**S**NOW — thaw — freeze, time after time, and the life of the ordinary, old-fashioned rope is gone.

To combat this demolishing action of the elements, several years ago Columbian designed its waterproofed rope. Many improvements have been made since its introduction and when you examine a length of new Columbian Rope, you are looking at the farthest advanced rope that science and skill can produce.

It is so thoroughly waterproofed by the Columbian method that it is sealed

against the elements and the germs of decay. In summer's torrents or winter's blizzards Columbian remains flexible. It is also rotproof. These features alone make Columbian all that could be desired of a rope, but these features, together with the famous Guarantee, give to Columbian a rope value that is incomparable.

Take Columbian on board and it will prove its extra value-giving qualities. Greater economy and longer service are built into every Columbian *Tape-Marked Line*.

### COLUMBIAN ROPE COMPANY

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Chicago

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# COLUMBIAN TAPE MARKED PURE MANILA ROPE

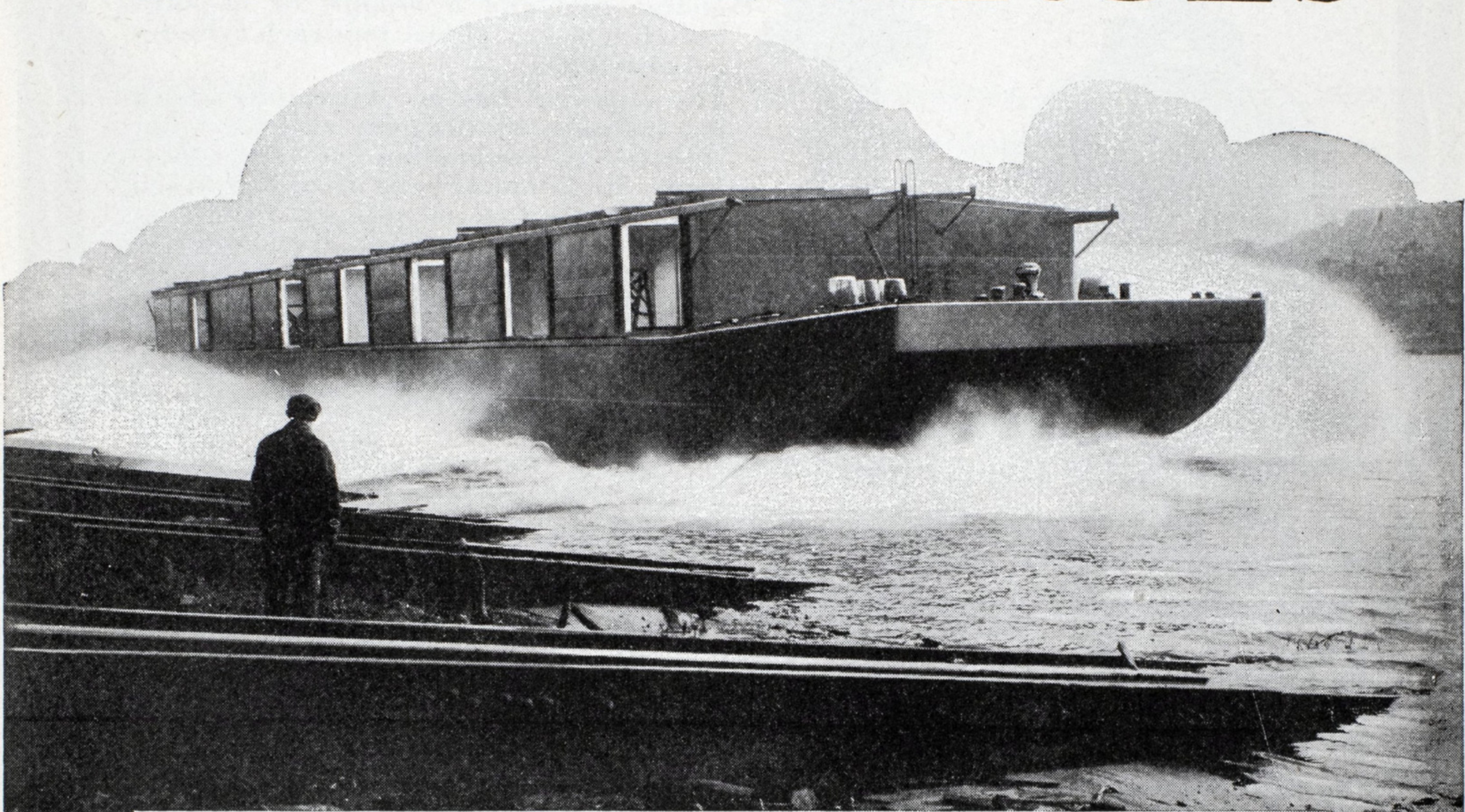


SINCE 1903

# AMERICAN BRIDGE COMPANY

has given special attention to DESIGNING and BUILDING

## STEEL BARGES



**T**HIS is the twenty-seventh consecutive year we have maintained the steel barge building yard at our structural steel fabricating plant at Ambridge, Pa. During this period of over a quarter of a century 1500 HULLS have been launched from the ways of this yard. Some of these were of unusual size or for special purposes, and

include standard barges, fuel lighters, a floating hangar, floating dry docks, dump scows, derrick boats, etc.

The services of our engineering forces are available for the preparation of specifications and the development of size and type of steel barges to meet the standard or special requirements of users or prospective users of inland waterways.

*Inquiries are solicited and will be given prompt attention.*

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*Subsidiary of United States Steel Corporation*

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**Columbia Steel Company**

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Seattle, Wash.

Los Angeles, Calif.

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Honolulu, T. H.

**Barge Department, Frick Building, Pittsburgh, Pa.**



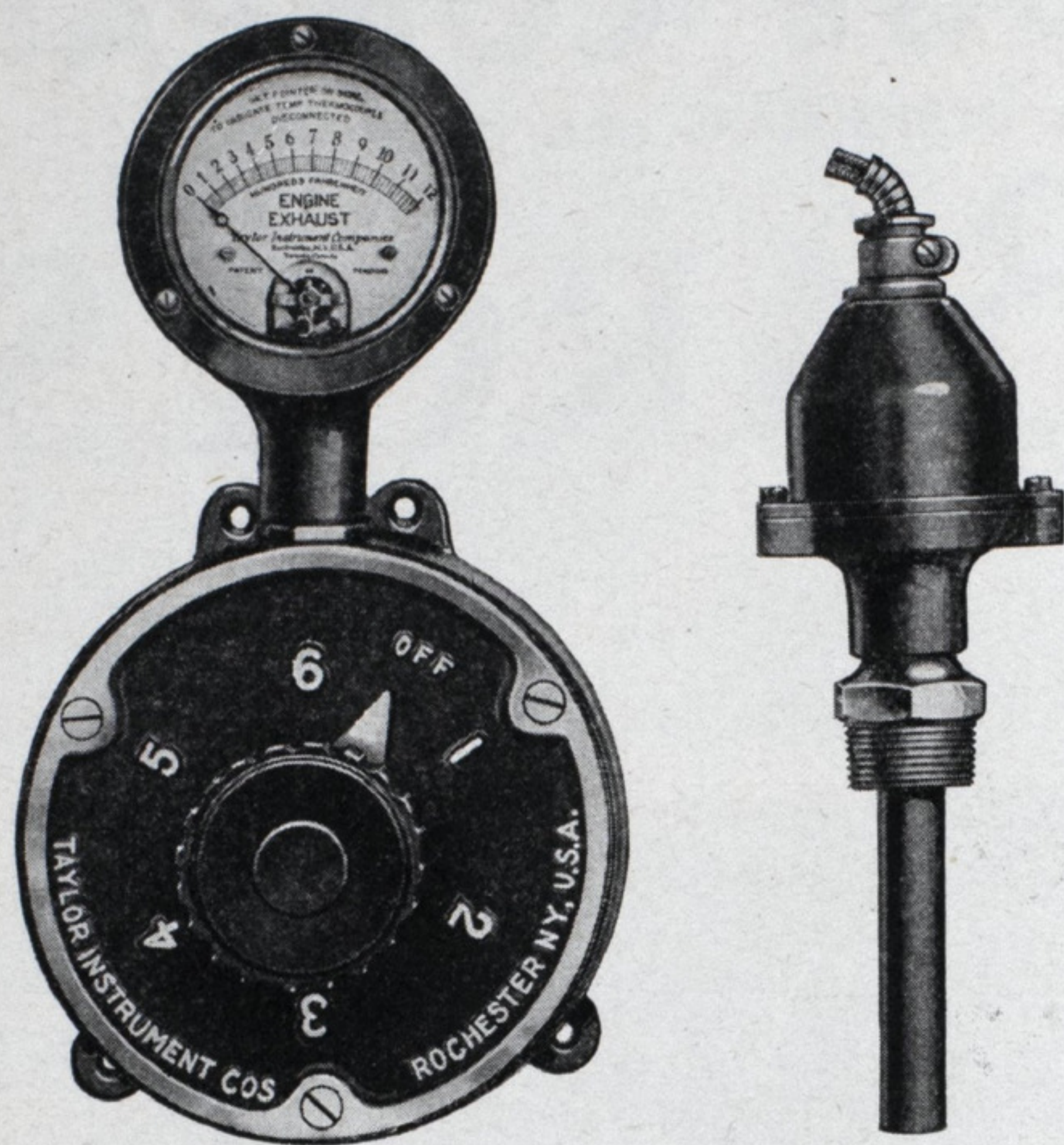
*Export Distributor:*

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30 Church Street  
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# Check your Exhaust Temperatures with a *Tycos* Diesel-Engine Pyrometer



**Diesel-Engine Pyrometer  
For Exhaust Temperatures**

**S**HIP engineers know how important it is to have a close check on how each cylinder of the Diesel Engines is functioning. Tycos Pyrometers for Exhaust Temperatures are specially designed to stand ship conditions and give the engineer the information he wants.

A Tycos Diesel-Engine Pyrometer with a thermocouple in each exhaust port discharge line and a 6-point or 12-point switch tells at a glance how each cylinder is behaving.

The engineer has an immediate check on cylinder lubrication, cooling water circulation, combustion and valve operation. He knows if he is using too much or too little fuel oil and can check on the condition of pistons and rings.

All this is valuable information . . . information the engineer needs and that a Tycos Pyrometer will give. Our engineers will be glad to tell you more about the application.

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**FLOORCRAFTERS**

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GOODYEAR RUBBERTILE

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**SELBY, BATTERSBY & CO.**

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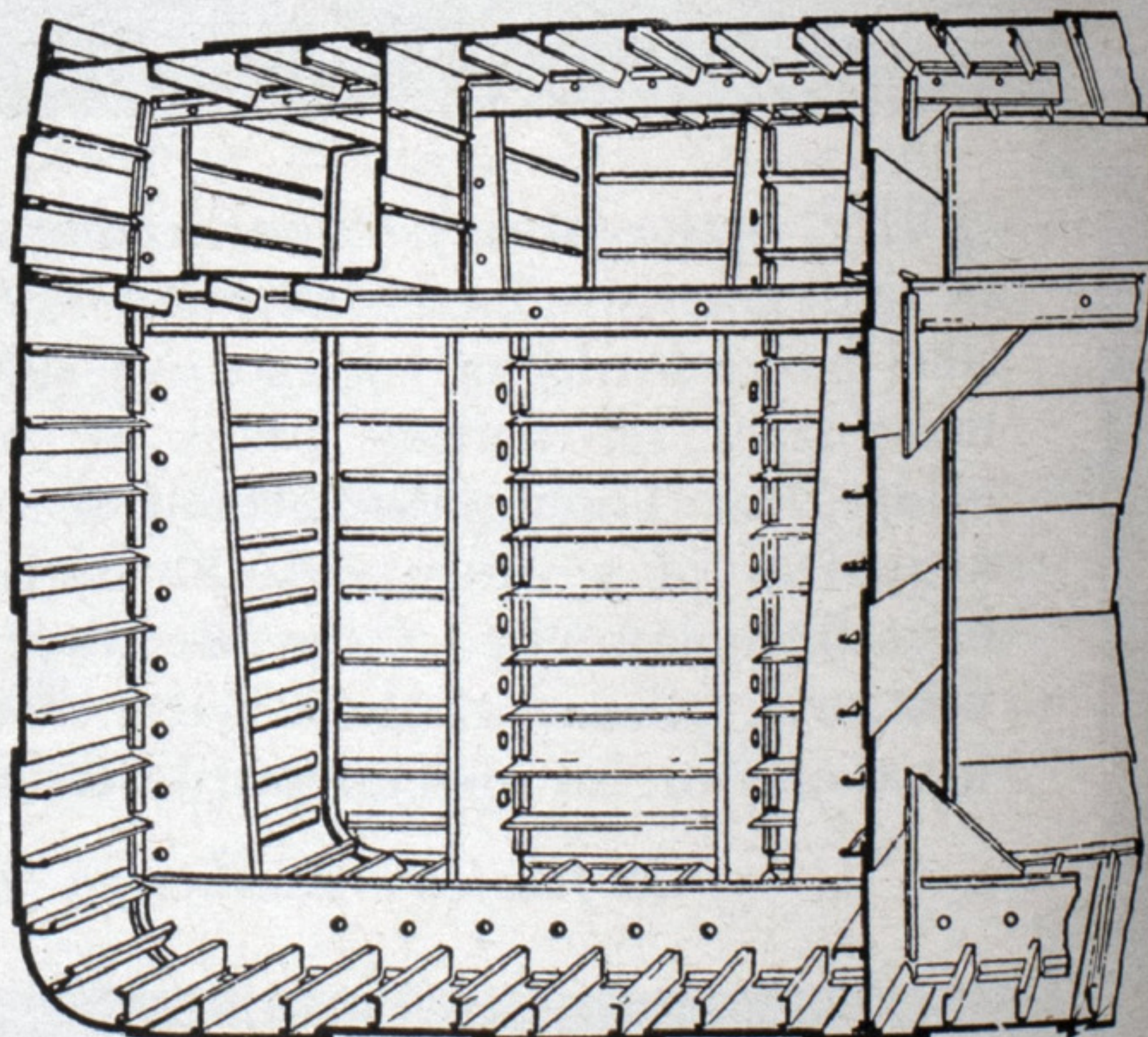


135 Liberty St.,  
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## Progress in Oil-Tank Ship Construction

### The "Bracketless-System"

(PATENT)



Eliminates Bulkhead Brackets  
Eliminates Bulkhead Leakage  
Greatly Simplifies Construction

Greatly Reduces Cost of Damage Repairs  
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Substantially Increases the Longitudinal Strength  
Beyond the Well-tried "Isherwood System"

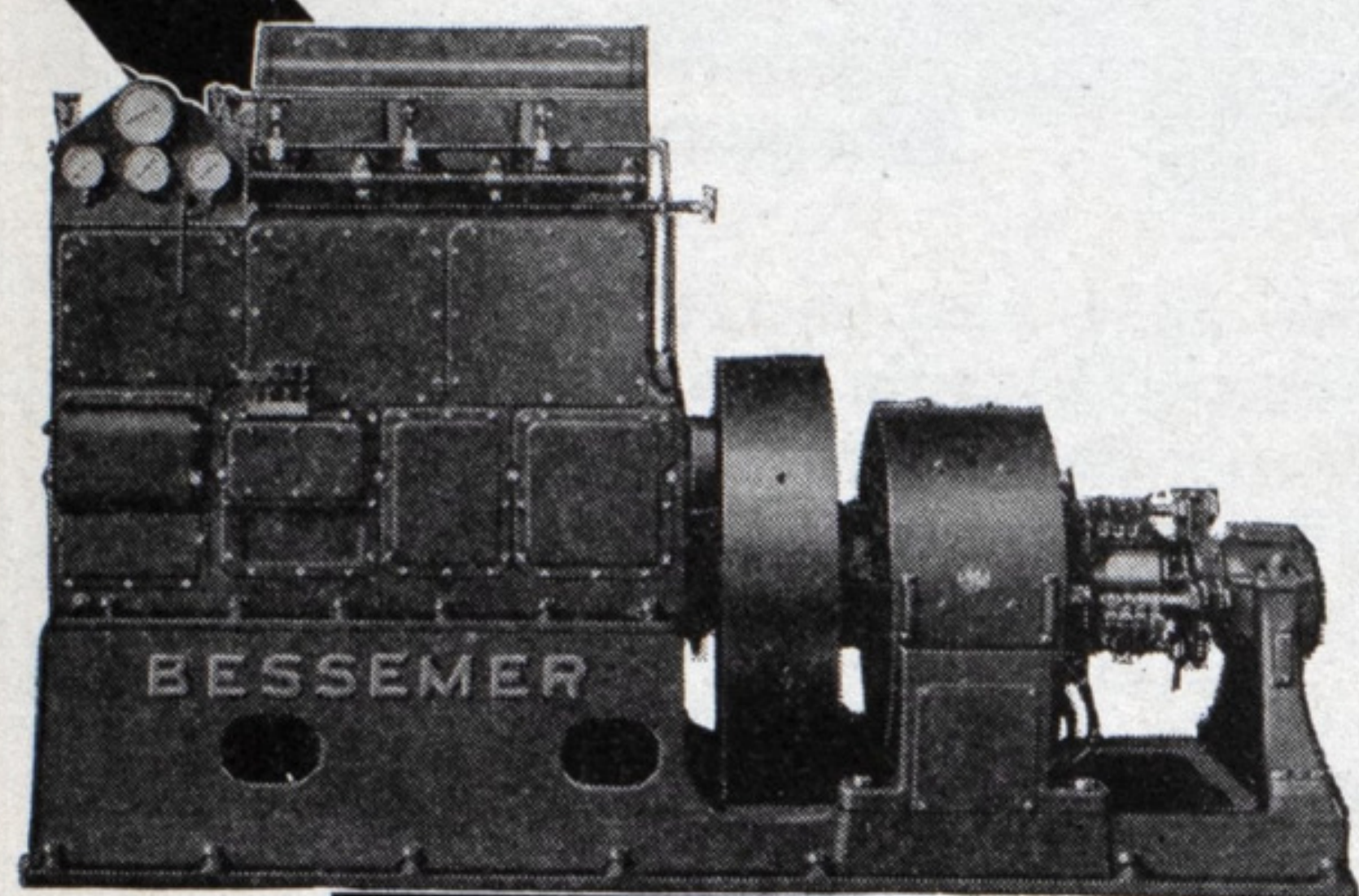
Shipowners are advised to specify that plans and structural arrangements should be approved by

**SIR JOSEPH W. ISHERWOOD & CO., Ltd.**

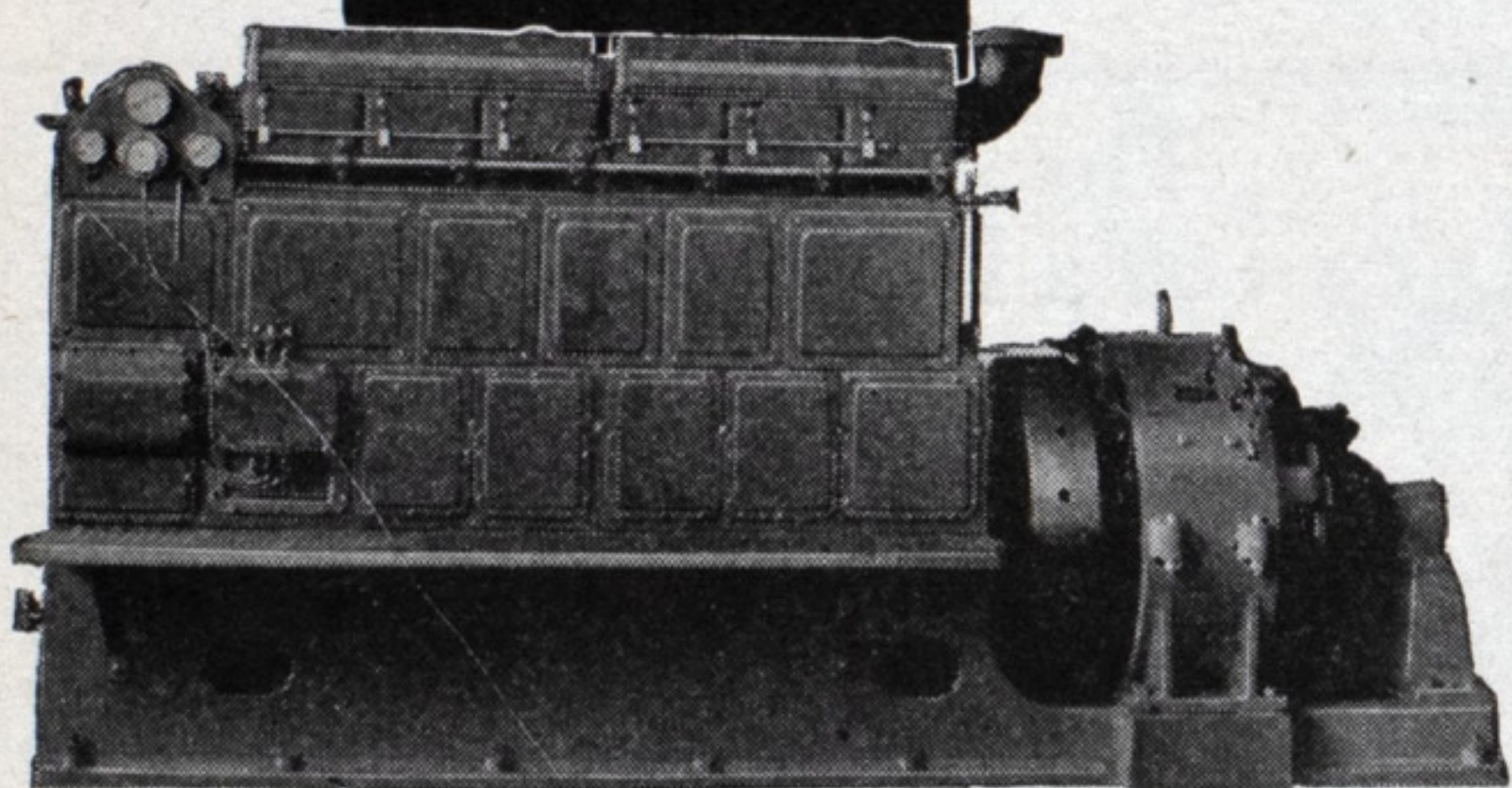
17 BATTERY PLACE, NEW YORK  
and 4, LLOYD'S AVENUE, LONDON, E. C. 3



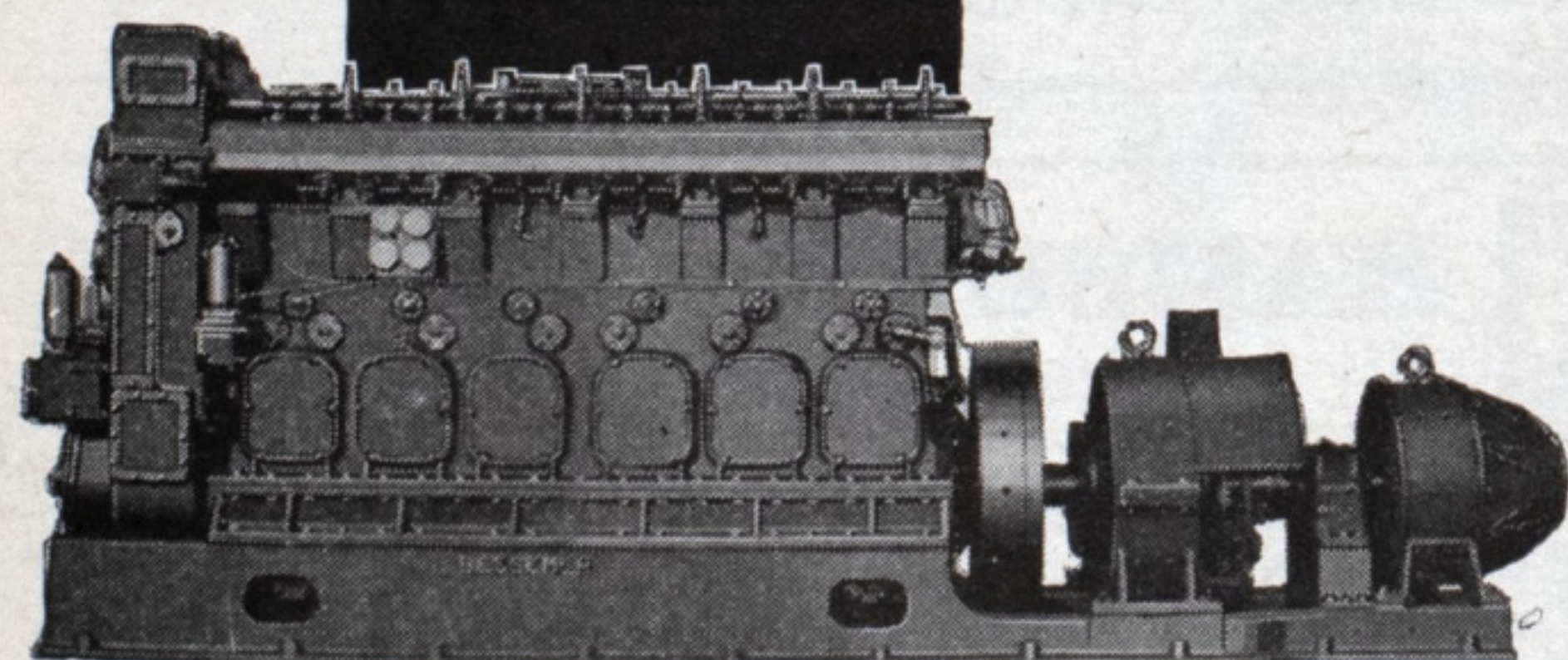
# CHOOSE YOUR AUXILIARY *Power* as carefully as your main power



A 3-CYLINDER 50 K.W.  
DIESEL AUXILIARY  
GENERATING SET



A 6-CYLINDER  
100 K. W. DIESEL  
AUXILIARY  
GENERATING SET



A 6-CYLINDER 150  
K. W. GENERATING  
SET FOR DIESEL  
ELECTRIC DRIVE

THE performance, economy and reliability of marine auxiliary power units are relatively as important as the main engines—and they should be chosen with the same degree of care.

With Cooper-Bessemer Diesel auxiliaries you are assured of the same smooth performance, the same economy of operation and maintenance and the same reliability that has so long characterized Cooper-Bessemer main engines in all types of commercial vessels.

There is a Cooper-Bessemer Diesel auxiliary generating set of a size and type for practically every marine need—from the small 3 cyl. 50 K.W. generating set to the large 8 cyl. 1,000 K.W. units. Each is built to the highest standard both in materials and workmanship and each has been thoroughly proved by performance in marine service.

Before selecting your auxiliary power equipment be sure to investigate Cooper-Bessemer. Our engineers will be glad to consult with you on your particular auxiliary power needs.

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Plants: Grove City, Pa.—Mt. Vernon, Ohio

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The problem of fresh air on ship-board has many puzzling angles. Allen engineers have solved them all, over and over again, and are ready to give you the benefit of their long experience. . . . . Fresh air is *free* with Allen Turbine Ventilators. They are automatic, self-trimming, run without power, and the pull of their exhaust is amazing. Our engineers are at your service. Write today for catalog and prices.

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# ALLEN TURBINE VENTILATORS

# DEAN BROS.

## MARINE PUMPS

*"The Dean of Pumps on Land and Sea"*

Single Style & Duplex  
Piston Type & Plunger

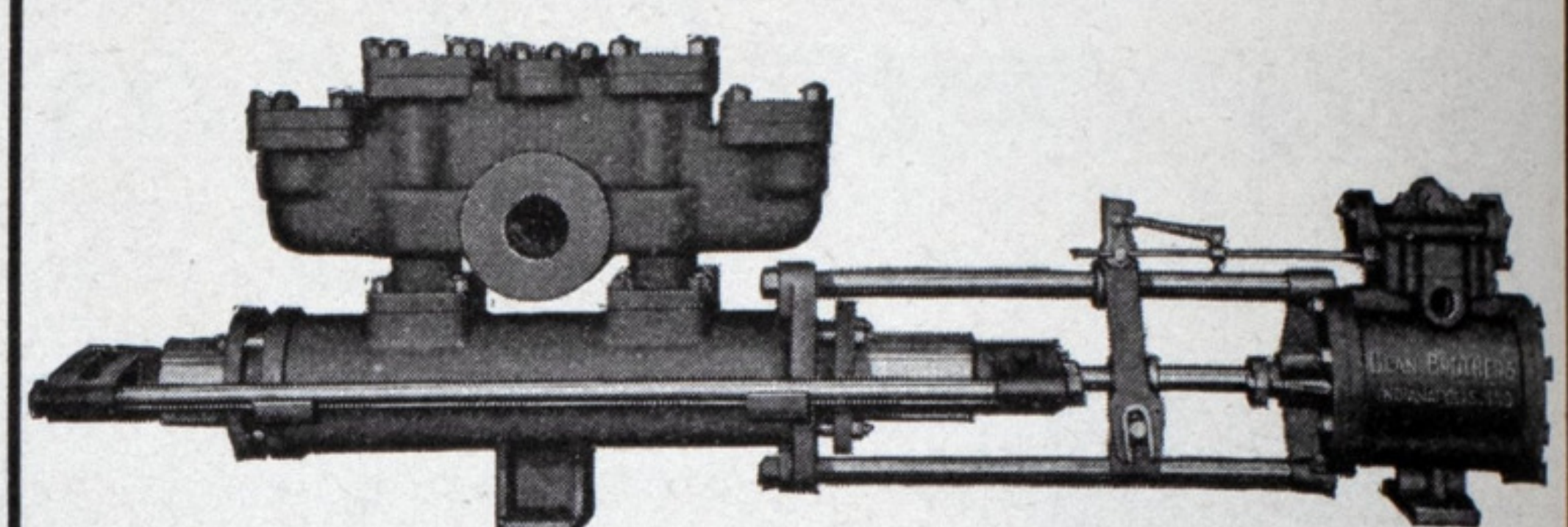


Figure No. 2311 Horizontal Single Style Double Acting Outside End Packed Plunger Trombone Pot Valve Pump For Boiler Feed & Pressure Service.

ESTABLISHED 1869

# DEAN BROS. COMPANY

MANUFACTURERS OF PUMPING MACHINERY FOR ALL PURPOSES  
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## Ship and Yacht Yards

realize that the basis of their success rests on economical and efficient drydocking equipment.

Progressive yards are coming more and more to be CRANDALL equipped for they know that

## Crandall Railway and Floating Dry Docks

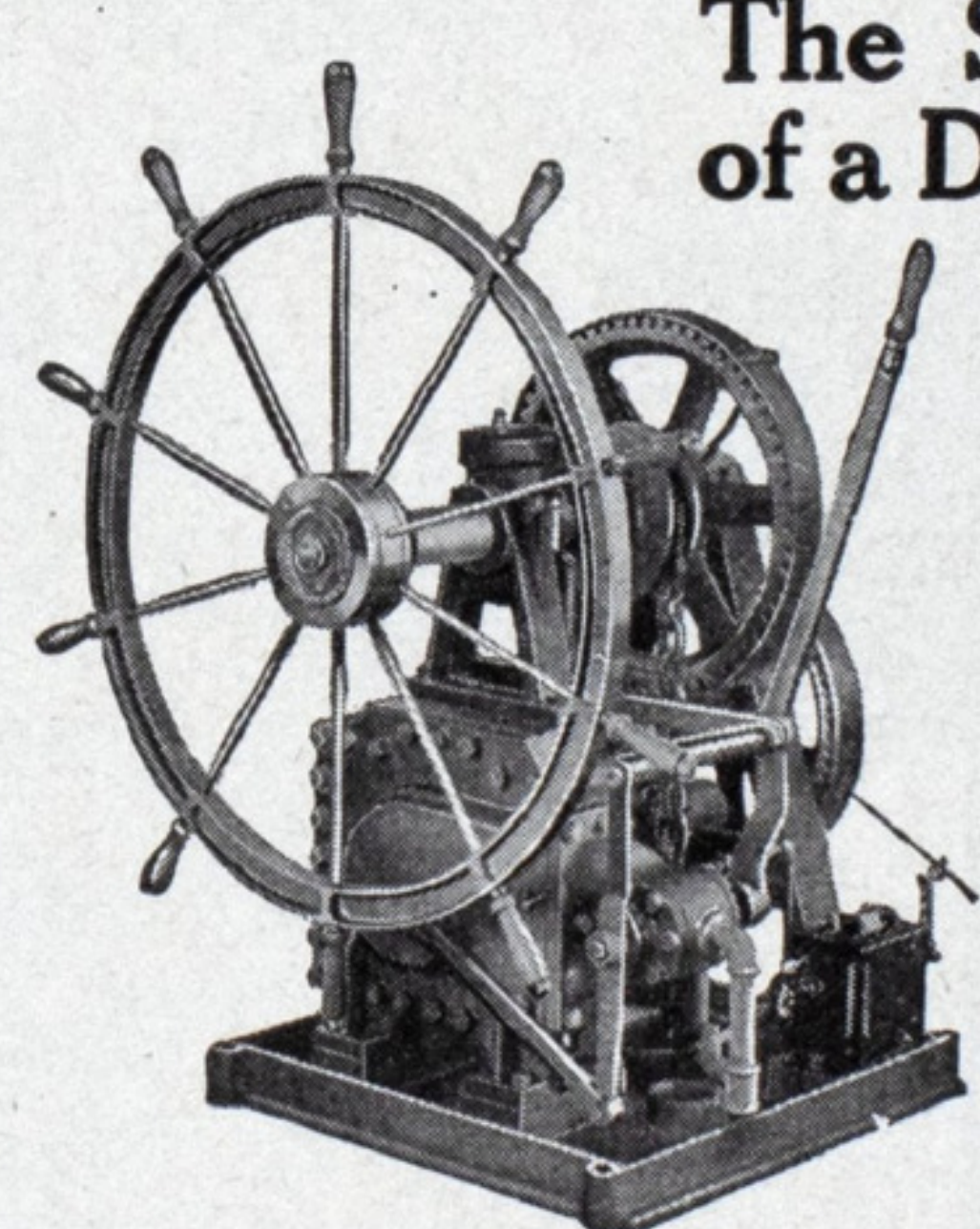
mean economy and efficiency, and that the designs are backed by more than 75 years of successful dry dock experience.

*Let us send you further information*

## The Crandall Engineering Co.

134 Main Street      Cambridge, Mass.

## The Strong, Quick Arm of a DAKE Steering Gear



on the tiller chain of your tug or steamer means greater efficiency, safety and economy.

The Dake engine has no dead center; it is always alert, and starts instantly in either direction. This insures easier, quicker and better handling of your boat and saves time, coal and accidents.

The Dake fits into your pilot house and has a hand steering combination feature for emergency use.

Dependable gears at extremely moderate prices.

*Ask any skipper who is shipmates with one*

## Dake Engine Co., Grand Haven, Mich.



## HAMBURG-AMERICAN LINE

**PASSENGER SERVICES:** New York to Cherbourg, Southampton and Hamburg. New York to Galway, Cobh (Queenstown), Cherbourg and Hamburg. North Pacific Ports to Hamburg, Bremen and Antwerp via Panama Canal.

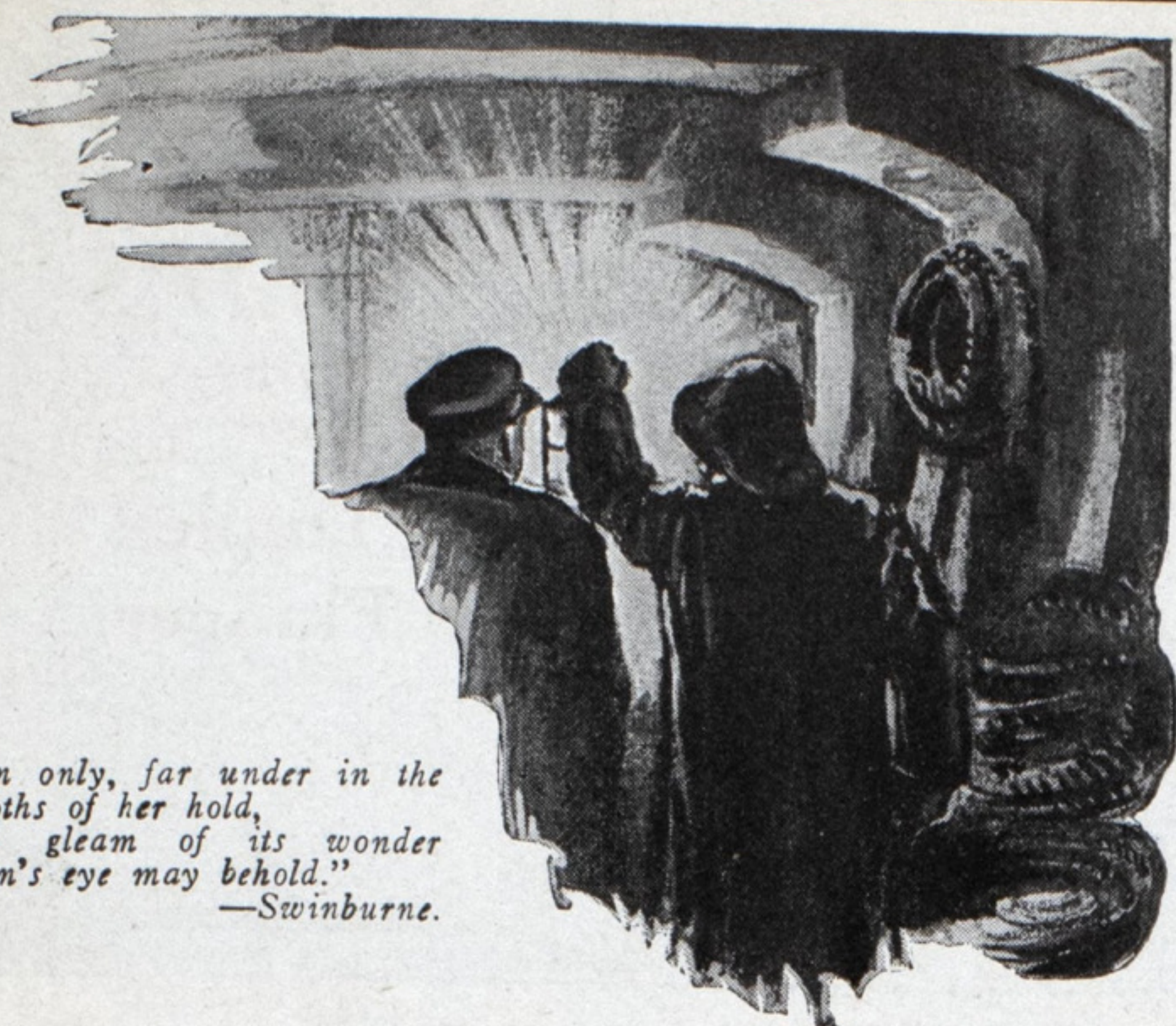
**PLEASURE CRUISES:** Around the World, to the West Indies, Northern Wonderlands, Mediterranean.

**FREIGHT SERVICES:** New York to Hamburg (8 days). Boston, Philadelphia, Baltimore and Norfolk to Bremen and Hamburg. North Pacific Ports direct to Hamburg, Bremen and Antwerp.

## HAMBURG-AMERICAN LINE

39 Broadway      New York





"Then only, far under in the depths of her hold, Some gleam of its wonder man's eye may behold."  
—Swinburne.

EACH beam, each well fitted timber, each sturdy rib and plank strong enough to stand the wildest gale,—and she's tight if properly caulked.

The experienced sailor knows the value of tight seams—no one need tell him that—but thousands of ships on the seven seas assure him that his seams will be *tightest* when caulked with

## STRATFORD OAKUM

For almost a century Stratford Oakum has caulked the seams of the finest vessels that sail the seas. Be sure you get genuine Stratford Oakum. There is no other "just as good."

George Stratford Oakum Company  
JERSEY CITY, NEW JERSEY

Also manufacturers of Cotton Wiping Waste

\*3

## SAMSON SPOT Log Lines

Smooth, tough and durable; no adulterating material to stiffen it and decrease strength and durability. Solid braided of extra quality cotton yarn. Uniform in size and quality. Easily identified by the colored spots, our trade mark.

We also manufacture flag halyards, lead lines, tiller rope; solid braided cotton cord in all sizes for various marine uses. Ask for catalog and samples.



Trade Mark  
Reg. U.S.  
Pat. Off.



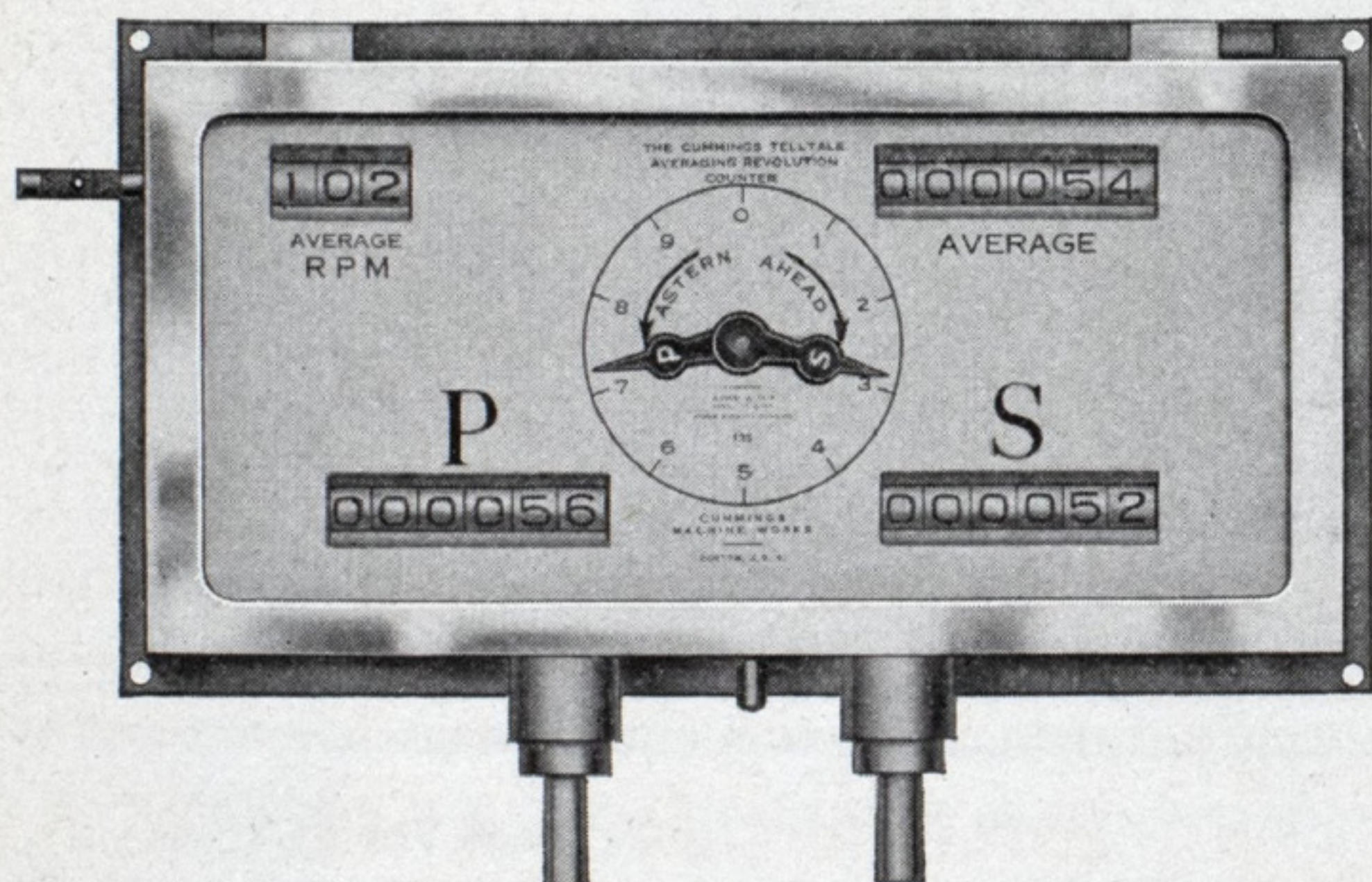
## SAMSON CORDAGE WORKS

89 BROAD STREET

BOSTON, MASS.



## CUMMINGS NEW TWO SHAFT TELLTALE AVERAGING COUNTER



ALL IN ONE CASE

15 SECONDS TO GET AVERAGE R P M

Total Revolutions for the Port and Starboard Shafts. The Two Hand Telltale shows at a glance the actual Performance of Each Shaft ahead and back and the proportionate speed of each.

## TORSION METERS

For Both Solid and Hollow Shaft

Full particulars upon application

Cummings Machine Works

255 Atlantic Ave., Boston, Mass.

## In the Seaports of the World—

wherever vessels go, SHIPMATES will be found. On yachts, steamers, schooners, tugs, lighters and barges, they travel the world over.

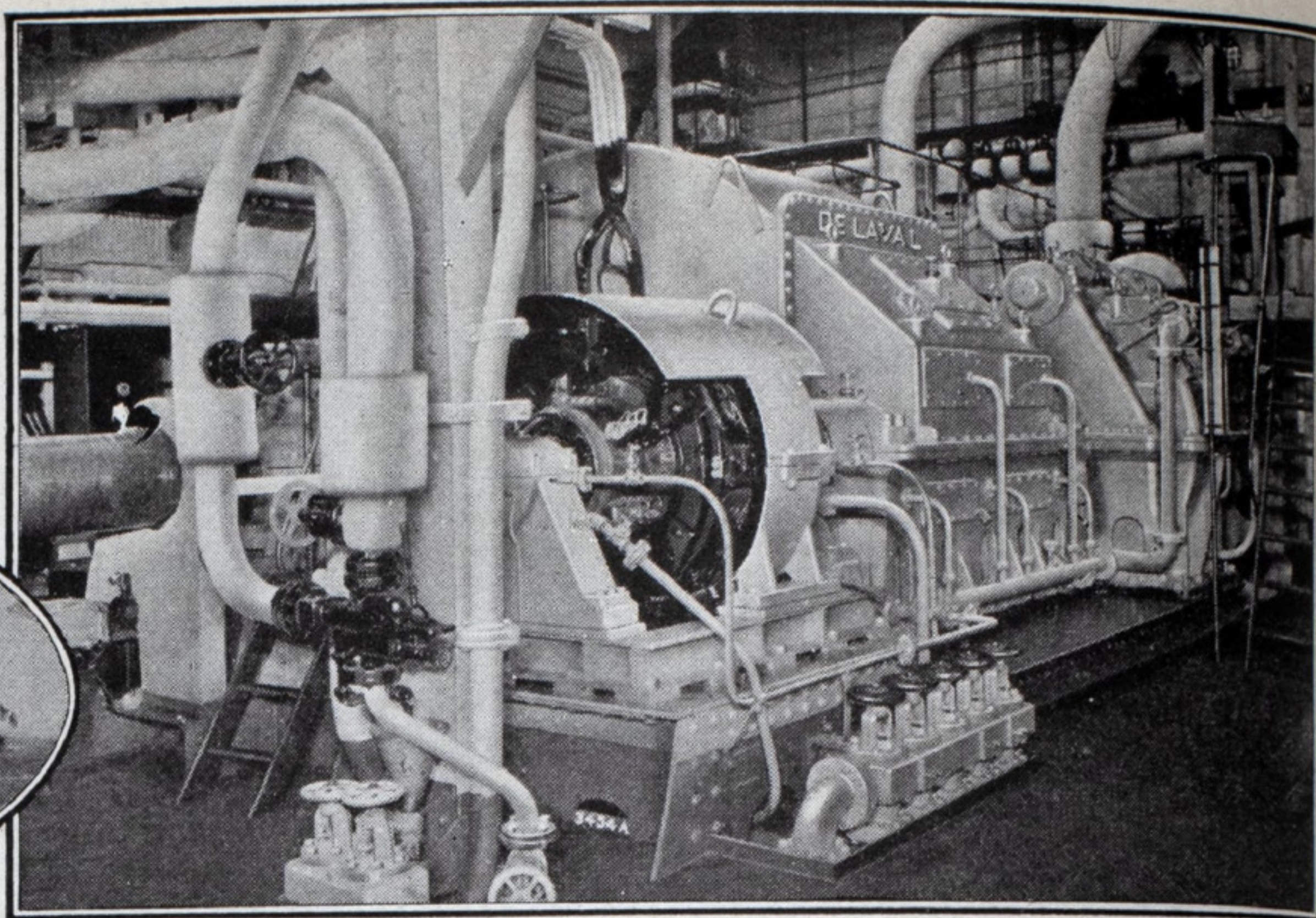
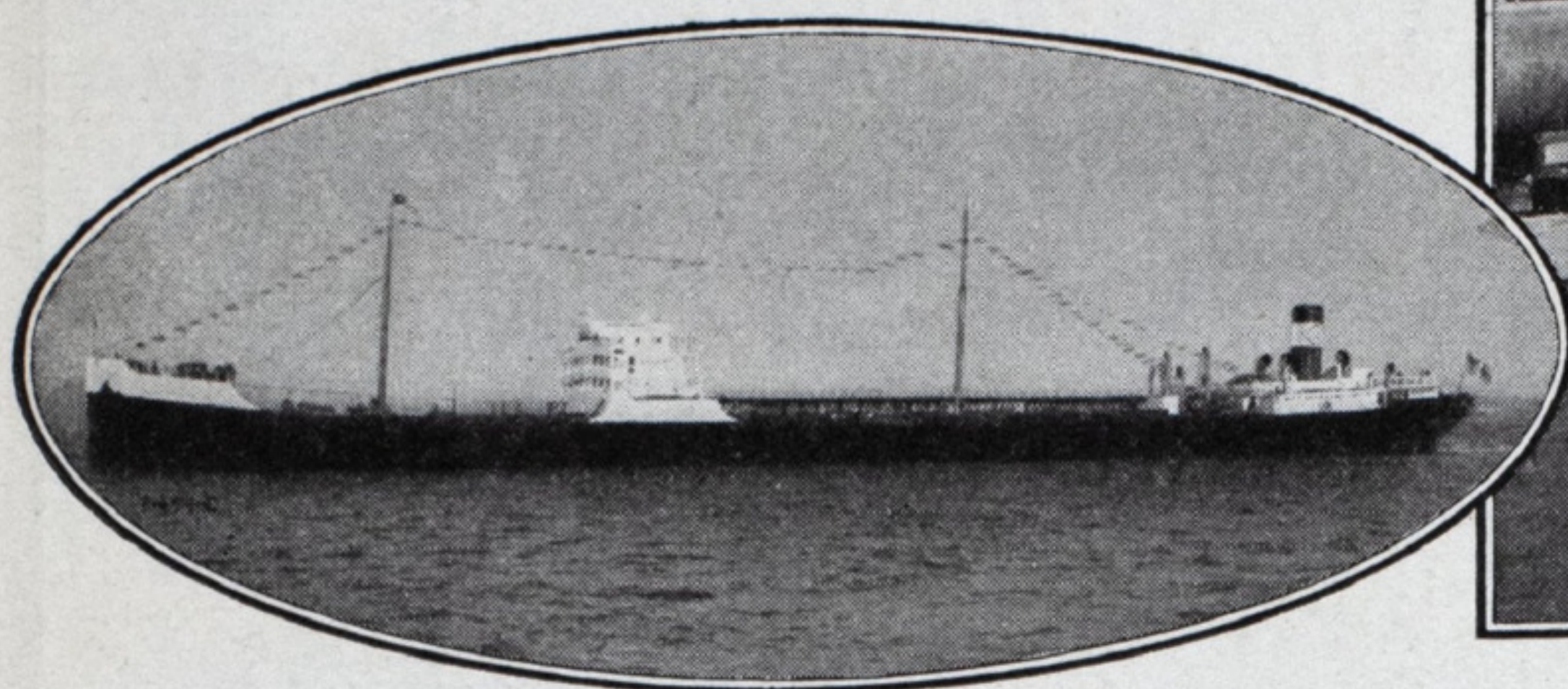
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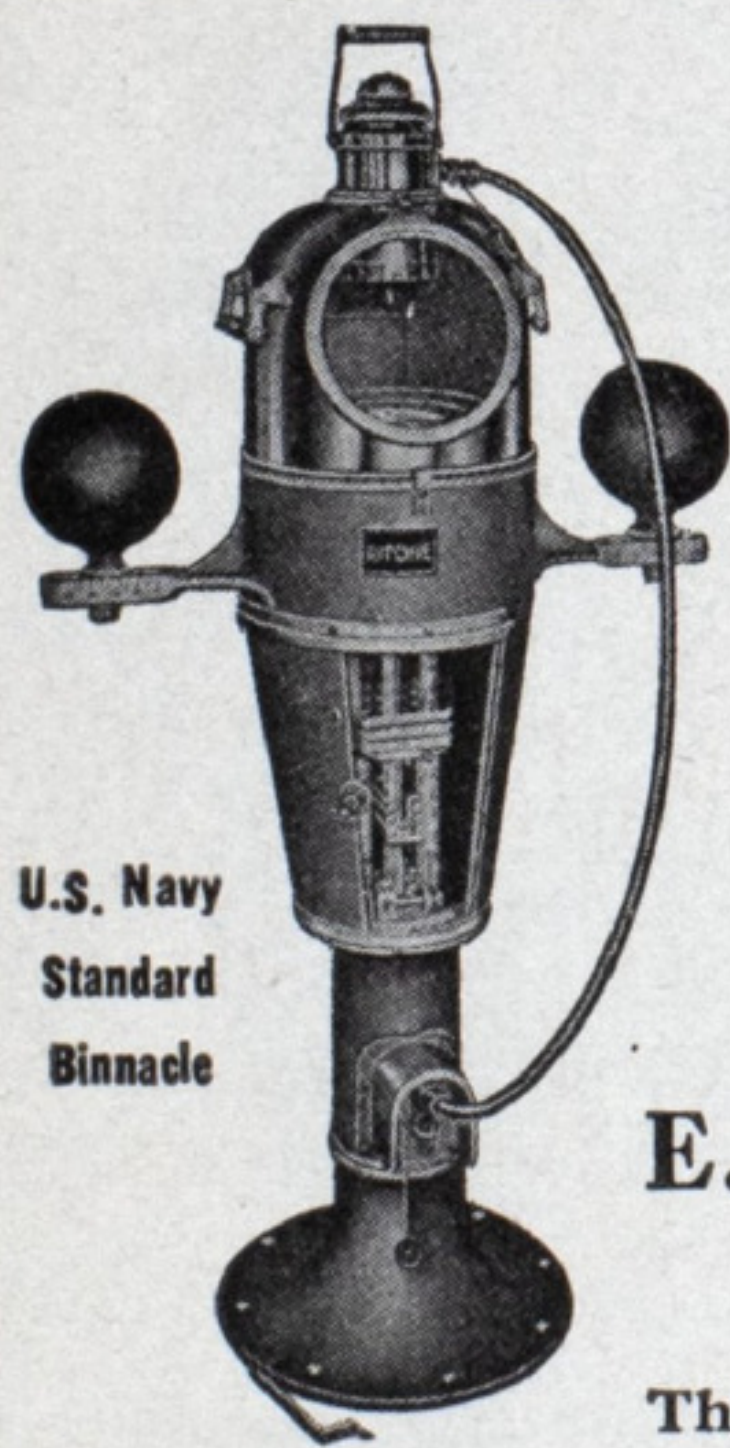
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2030

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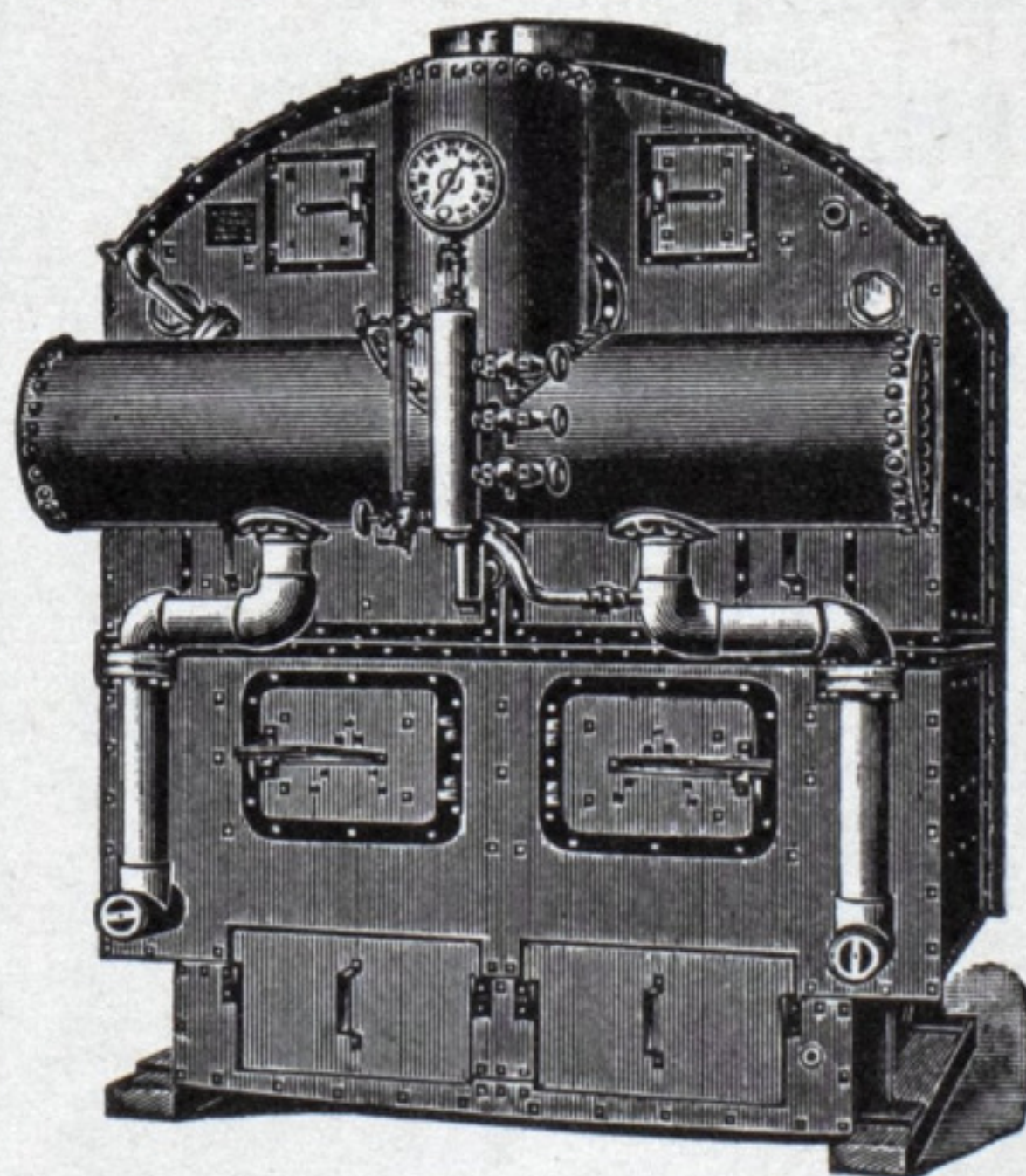


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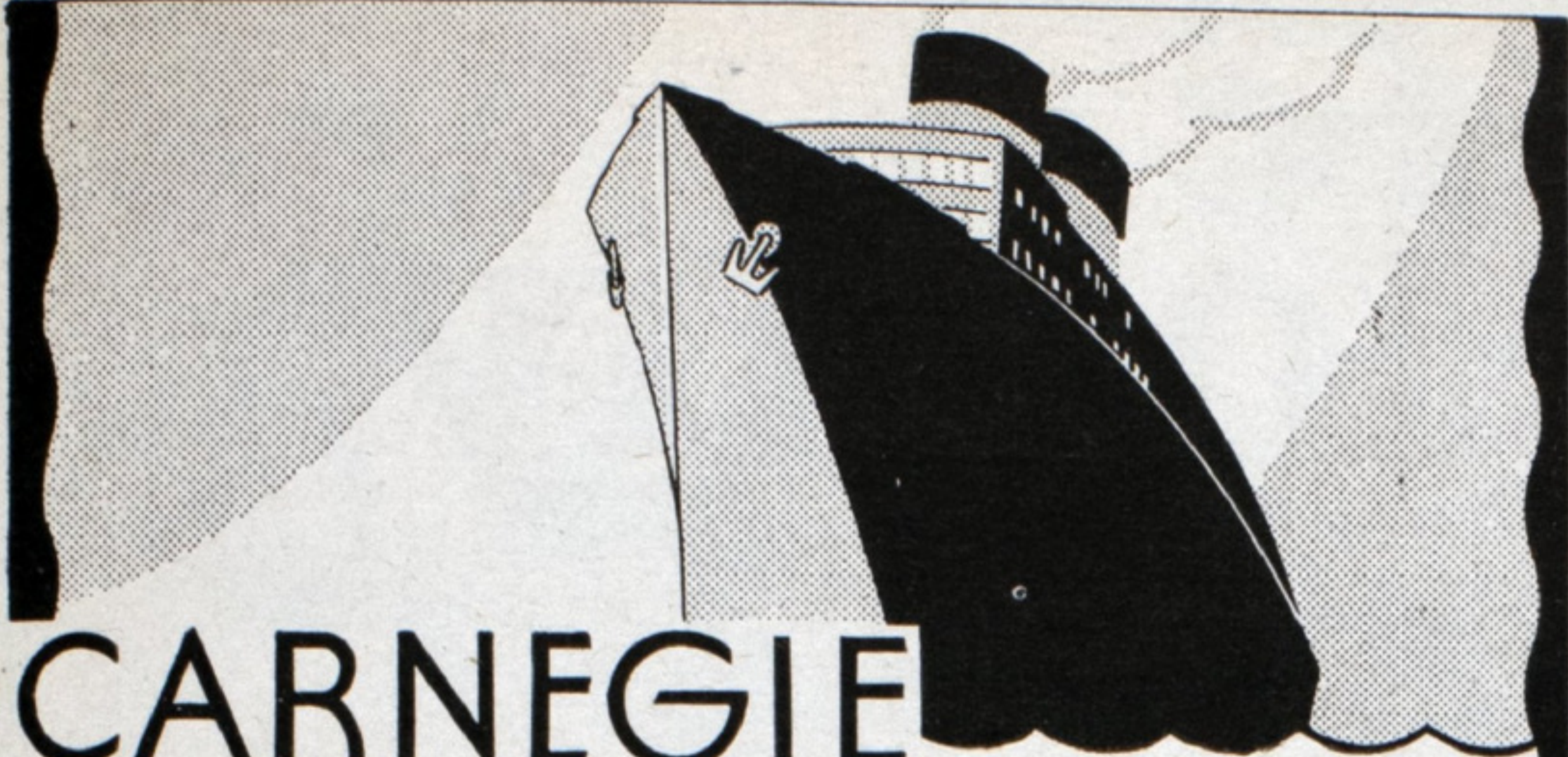
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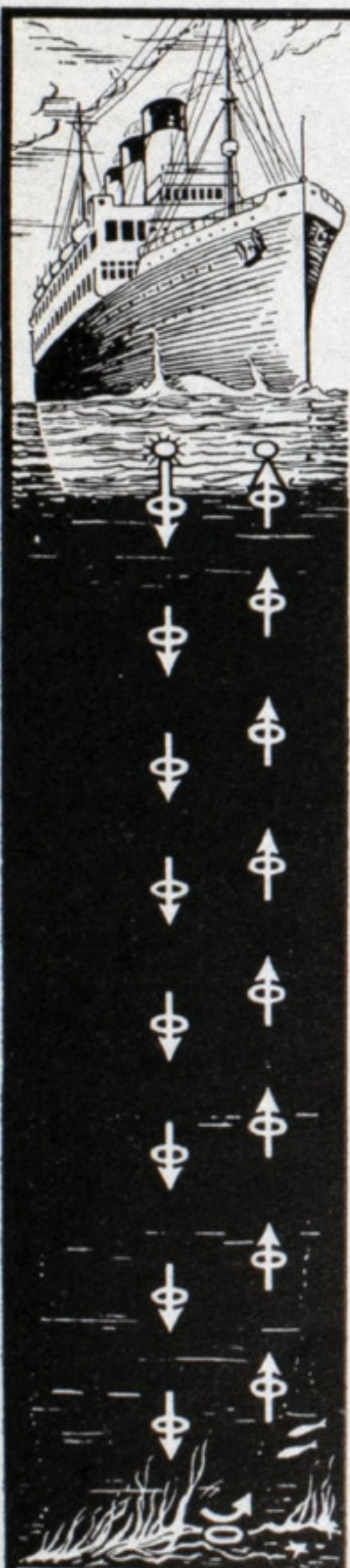
The name "Carnegie" has been identified with steel manufacture for nearly three-quarters of a century—a good name to look for on Steel.

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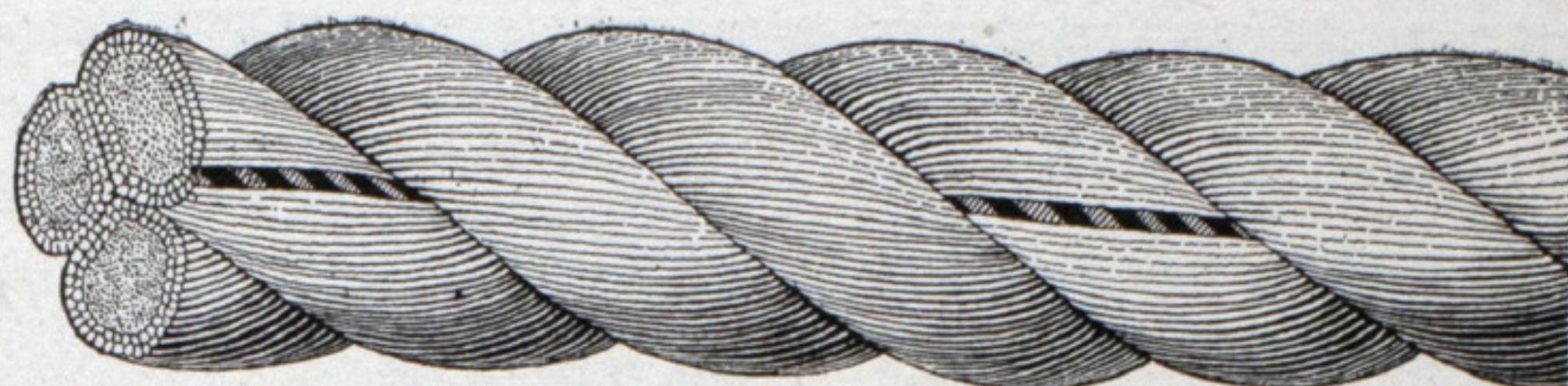
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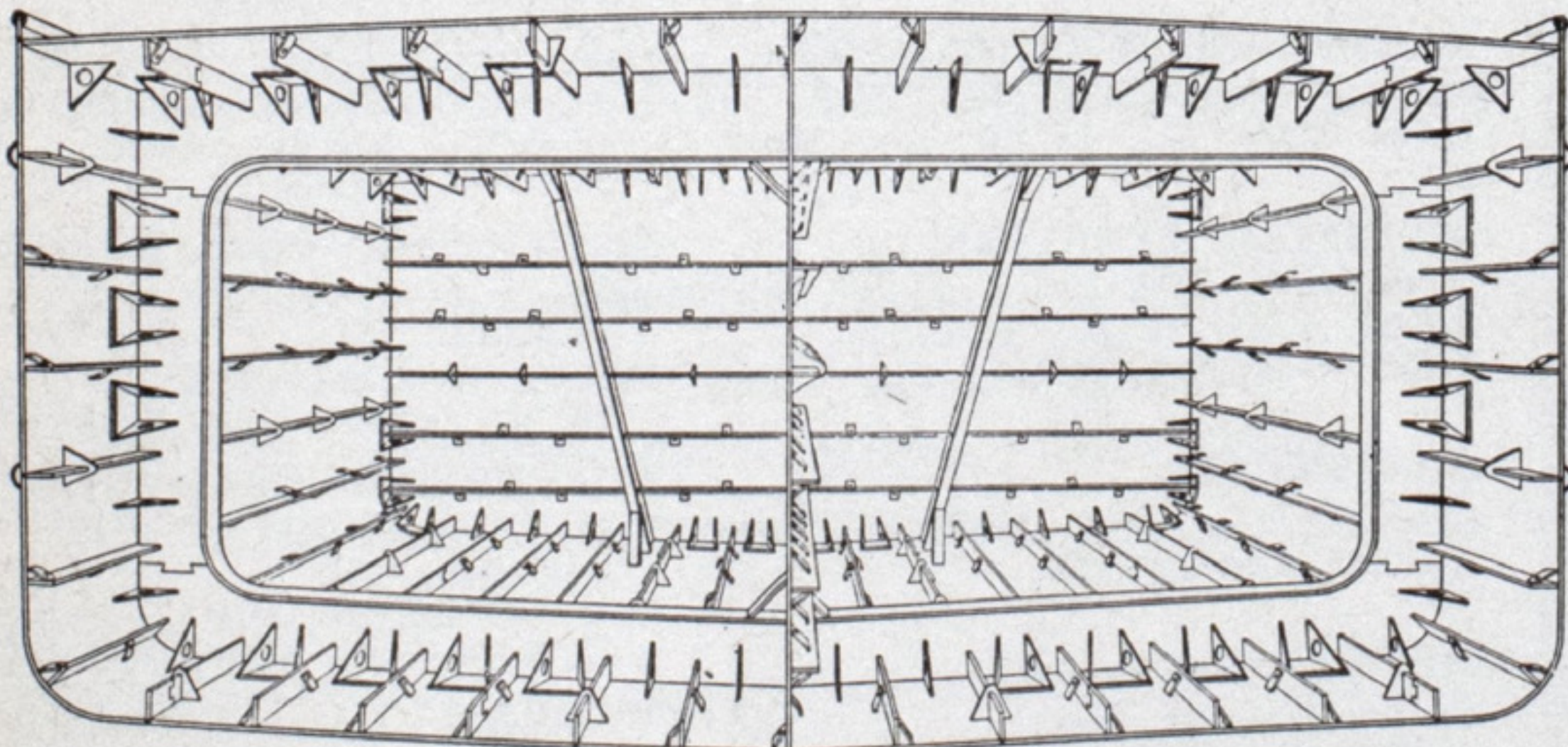
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Welin Davit & Boat Corp.,  
3-5 Vernon Ave.,  
Long Island City, N. Y.

**LIFESAVING EQUIPMENT**

Lane, C. M., Lifeboat Co., Inc.,  
856 Humboldt St., Brooklyn, N. Y.

**LIGHTING EQUIPMENT**

Westinghouse Electric & Mfg. Co.  
S. Philadelphia, Pa.

**LUBRICATING OIL**

Standard Oil Co., of New Jersey,  
26 Broadway, New York City.  
Vacuum Oil Co.,  
61 Broadway, New York City.

**MACHINERY (Marine)**

American Shipbuilding Co.,  
Foot of W. 54th St., Cleveland, O.  
Bethlehem Shipbuilding Corp., Ltd.,  
Bethlehem, Pa.  
Cooper-Bessemer Corp., The,  
Grove City, Pa.  
Great Lakes Engineering Works,  
River Rouge, Mich.  
Manitowoc Ship Building Corp.,  
Manitowoc, Wis.  
Maryland Dry Dock Co.,  
Baltimore Md.

**MACHINES (Sounding)**

Submarine Signal Co.,  
160 State St., Boston, Mass.

**MACHINISTS**

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Foot of W. 54th St., Cleveland, O.  
New York Shipbuilding Co.,  
Camden, N. J.

**MAGNETS (Lifting)**

Cutler-Hammer, Inc.,  
1265 St. Paul Avenue,  
Milwaukee, Wis.

**MANILA OAKUM—See OAKUM  
(Marine, Rope, Packings,  
Plumbers)****MARINE RAILWAY BUILDERS**

Crandall Engineering Co., The,  
134 Main St., Cambridge, Mass.

**MATERIAL HANDLING  
EQUIPMENT**

Smith, Leathem D., Dock Co.,  
Sturgeon Bay, Wis.

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Simmons Co., The, 666 Lake Shore  
Drive, Chicago, Ill.

**METERS (Gas & Air)**

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1265 St. Paul Avenue,  
Milwaukee, Wis.

**MOTOR GENERATOR SETS**

General Electric Co.,  
Schenectady, N. Y.  
Troy Engine & Machine Co.,  
Troy, Pa.  
Westinghouse Electric & Mfg. Co.,  
S. Philadelphia, Pa.

**MOTORS (Electric)**

General Electric Co.,  
Schenectady, N. Y.  
Troy Engine & Machine Co.,  
Troy, Pa.  
Westinghouse Electric & Mfg. Co.,  
East Pittsburgh, Pa.

**NAUTICAL INSTRUMENTS**

Ritchie, E. S., & Sons,  
Brookline, Mass.  
Sperry Gyroscope Co., The,  
Brooklyn, N. Y.

**NAVIGATING INSTRUMENTS**

White, Kelvin & Wilfrid O., Co.,  
112 State St., Boston, Mass.

**NEON**

Linde Air Products Co., The,  
30 E. 42nd St., New York City.

**NITROGEN**

Linde Air Products Co.,  
30 East 42nd St., New York City

**OAKUM (Marine, Rope, Packings,  
Plumbers)**

Stratford, George, Oakum Co.,  
120 Montgomery St.,  
Jersey City, N. J.

**OIL BURNING EQUIPMENT**

Babcock & Wilcox Co.,  
85 Liberty St., New York City.  
Bethlehem Shipbuilding Corp., Ltd.,  
Bethlehem, Pa.  
Coen Co., Inc., 610 S. Broadway,  
Los Angeles, Cal.  
Sturtevant, B. F., Co.,  
Hyde Park, Boston, Mass.

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(Marine)**

Vacuum Oil Co., 61 Broadway,  
New York City.

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**OXYGEN**

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30 East 42nd St., New York City.

**PASSENGER SERVICE**

Hamburg-American Line,  
39 Broadway, New York City.

**POWDERED COAL BURNERS**

Coen Co., Inc., 610 S. Broadway,  
Los Angeles, Cal.

**PROPELLER BLADES AND HUBS**

Sheriffs Mfg. Co., Milwaukee, Wis.

**PROPELLER WHEELS**

American Shipbuilding Co.,  
Foot of W. 54th St., Cleveland, O.  
Great Lakes Engineering Works,  
River Rouge, Mich.  
Newport News Shipbuilding & Dry  
Dock Co., 233 Broadway,  
New York City.  
Sheriffs Mfg. Co., Milwaukee, Wis.

**PROPELLERS**

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Bethlehem, Pa.  
Ferguson, F., & Son,  
Hoboken, N. J.  
Hyde Windlass Co., Bath, Me.  
Newport News Shipbuilding & Dry  
Dock Co., 233 Broadway,  
New York City.

**PULVERIZED COAL BURNERS**

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Fullerton, Pa.  
Todd Shipyards Corp.,  
25 Broadway, New York City.

**PULVERIZED COAL SYSTEMS**

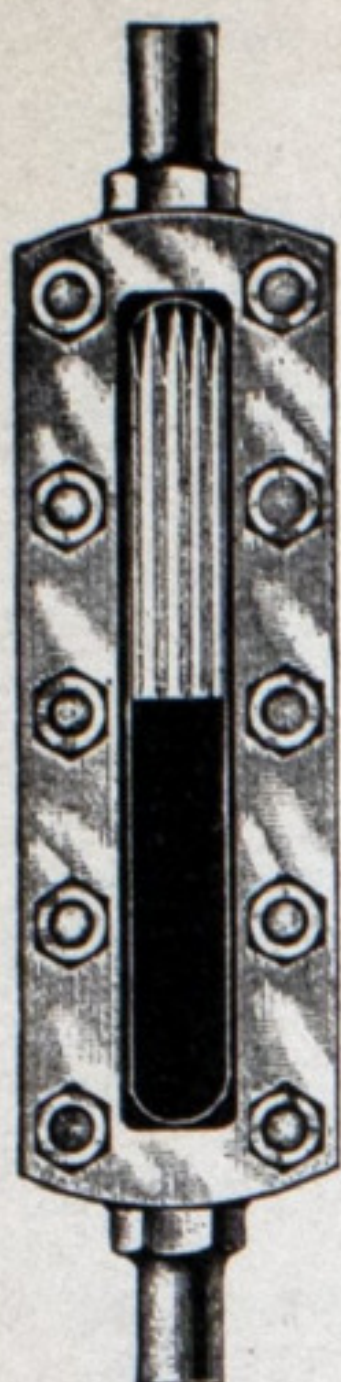
Fuller-Lehigh Co.,  
Fullerton, Pa.  
Todd Shipyards Corp.,  
25 Broadway, New York City.

**PUMPS**

Dean Brothers Co.,  
323 W. 10th St., Indianapolis, Ind.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above





## REFLEX WATER GAGES

Used on all types of boilers by all the Principal Navies of the world

### "The Water Shows Black"

**ADVANTAGES:** Quick and reliable observation of the water level. Safe, sure and durable at high pressure. Not affected by cold air drafts. Most effective protection against injuries to boilers and workmen. Easily applied to all types of gage glass fittings.

When filled with WATER the Reflex Gage always appears **BLACK**. When empty it instantly shows **WHITE**. No mistake possible. This feature alone is worth many times the cost of the Reflex.

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**FERGUSON**  
**GAGE & VALVE CO.**  
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On board the new American Export Liner, "Excalibur" . . . on board the new Ward Liner, "Morro Castle" . . . on board the new Grace Liner, "Santa Clara" . . . on board the new American-South African Liner, "City of New York" . . . on board the new Coast Guard Cutters, "Itaska", "Sebago", "Saranac".

In fact, on board most all of the outstanding new ships—and the older ones—you will find Paracoil equipment holding responsible positions. Paracoil Feed Water Heaters, Evaporators, Distillers, Lubricating Oil Coolers, etc., etc., have been standard marine equipment for many years. Write for bulletins.

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President Harding  
Pacific Sun  
President Fillmore  
Hendrik Hudson  
Alexander  
Hamilton  
President Garfield  
Morro Castle  
Santa Clara  
City of New York  
Itaska  
Sebago  
Saranac  
etc., etc., etc.

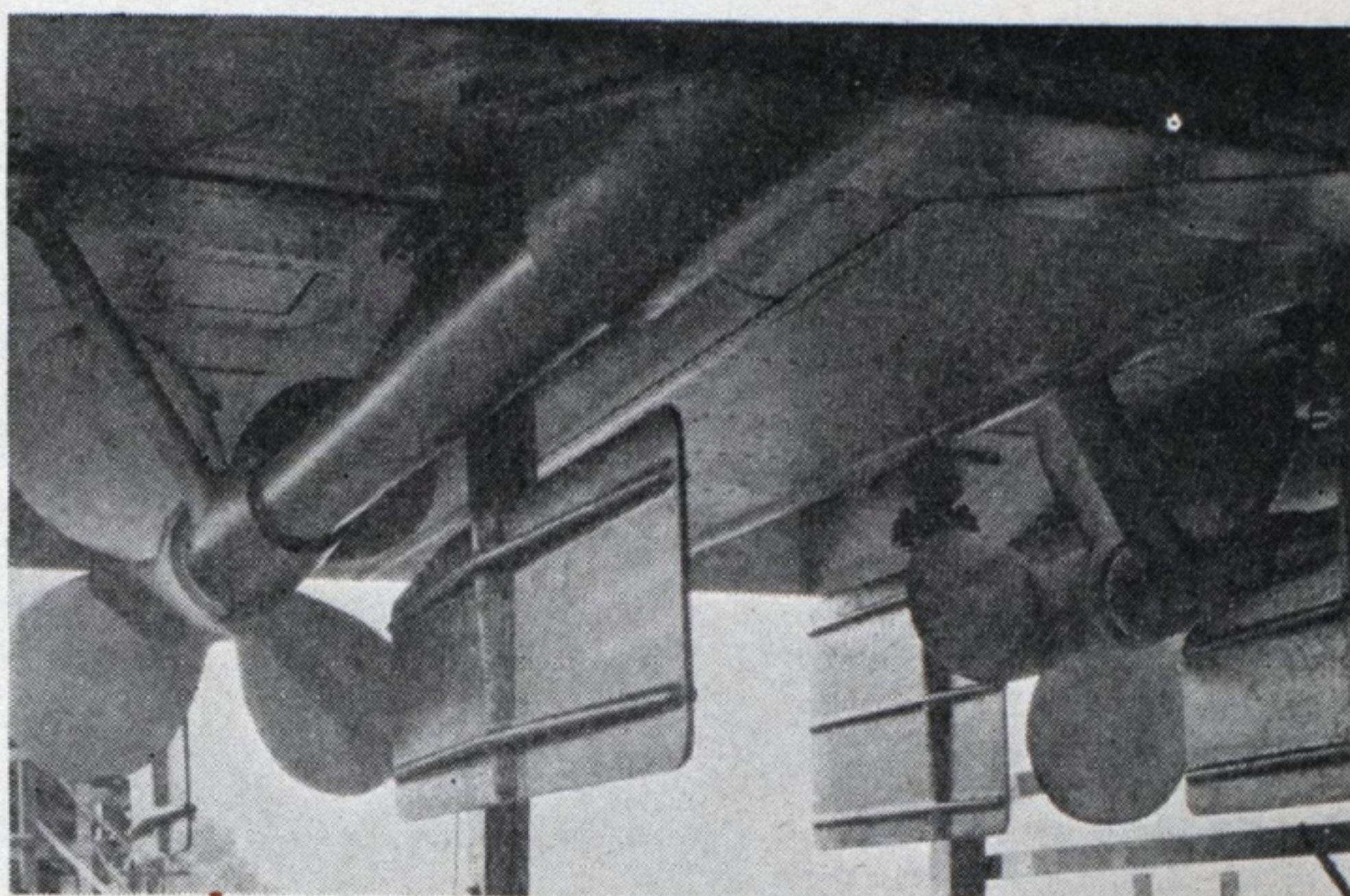
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If you have a passenger ship, freighter, tanker, tug or any other floating property or marine equipment for sale advertise it in Marine Review.

The rate is \$3.00 for a minimum advertisement of 30 words. Additional words, 10c each.

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*are good wheels*



They are on the  
Tugboat "William Dickinson"

**BRONZE  
IRON  
SEMI-STEEL**

**F. FERGUSON & SON**  
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Dean Brothers Co.,  
323 W. 10th St., Indianapolis, Ind.

**PUMPS (Bilge)**  
Dean Brothers Co.,  
323 W. 10th St., Indianapolis, Ind.

**PUMPS (Boiler Feed)**  
Dean Brothers Co.,  
323 W. 10th St., Indianapolis, Ind.

**PUMPS (Direct Acting)**  
Dean Brothers Co.,  
323 W. 10th St., Indianapolis, Ind.

**PUMPS (Fuel Oil)**  
Coen Co., Inc., 610 S. Broadway,  
Los Angeles, Cal.

**PUMPS (Power)**  
Dean Brothers Co.,  
323 W. 10th St., Indianapolis, Ind.

**PUMPS (Steam)**  
Dean Brothers Co.,  
323 W. 10th St., Indianapolis, Ind.

**PUMPS (Vacuum)**  
Dean Brothers Co.,  
323 W. 10th St., Indianapolis, Ind.

**PURIFICATION SYSTEMS—See  
WATER PURIFICATION  
SYSTEMS**

**PYROMETERS (Diesel Engine)**  
Taylor Instrument Co's.,  
90 Ames St., Rochester, N. Y.

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DIRECTION FINDER**  
Radiomarine Corp. of America,  
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Radiomarine Corp. of America,  
66 Broad St., New York City.

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Brooklyn, N. Y.

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134 Main St., Cambridge, Mass.

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Ingersoll-Rand Co.,  
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Maryland Dry Dock Co.,  
Baltimore, Md.

**REPAIRS (Electric)**  
Westinghouse Electric & Mfg. Co.,  
S. Philadelphia, Pa.

**REPAIRS (Marine)**  
American Shipbuilding Co.,  
Foot of W. 54th St., Cleveland.  
Bethlehem Shipbuilding Corp., Ltd.,  
Bethlehem, Pa.  
Charleston Dry Dock & Machine Co.,  
Charleston, S. C.  
Chicago Shipbuilding Co.,  
So. Chicago, Ill.  
Great Lakes Engineering Works,  
River Rouge, Mich.  
Manitowoc Ship Building Corp.,  
Manitowoc, Wis.  
Newport News Shipbuilding & Dry  
Dock Co., 233 Broadway,  
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New York Shipbuilding Co.,  
Camden, N. J.  
Sun Shipbuilding & Dry Dock Co.,  
Chester, Pa.  
Todd Shipyards Corp.,  
25 Broadway, New York City.  
United Dry Docks, Inc.,  
11 Broadway, New York City

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Westinghouse Electric & Mfg. Co.,  
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Sperry Gyroscope Co.,  
Manhattan Bridge Plaza,  
Brooklyn, N. Y.

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Sperry Gyroscope Co., The,  
Brooklyn, N. Y.

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General Electric Co.,  
Schenectady, N. Y.  
Sperry Gyroscope Co., The,  
Brooklyn, N. Y.

**SELF UNLOADING EQUIPMENT**  
Smith, Leathem D., Dock Co.,  
Sturgeon Bay, Wis.

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85 Liberty St., New York City.  
Bethlehem Shipbuilding Corp., Ltd.,  
Bethlehem, Pa.

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Foot of W. 54th St., Cleveland.  
Bethlehem Shipbuilding Corp., Ltd.,  
Bethlehem, Pa.  
Charleston Dry Dock & Machine Co.,  
Charleston, S. C.  
Great Lakes Engineering Works,  
River Rouge, Mich.  
Manitowoc Ship Building Corp.,  
Manitowoc, Wis.  
Maryland Dry Dock Co.,  
Baltimore, Md.  
Newport News Shipbuilding & Dry  
Dock Co., 233 Broadway,  
New York City.  
New York Shipbuilding Co.,  
Camden, N. J.  
Smith, Leathem D., Dock Co.,  
Sturgeon Bay, Wis.  
Sun Shipbuilding & Dry Dock Co.,  
Chester, Pa.  
Todd Shipyards Corp.,  
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United Dry Docks, Inc.,  
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Brooklyn, N. Y.

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160 State St., Boston, Mass.

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160 State St., Boston, Mass.

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(Steel)**

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Bethlehem Shipbuilding Corp., Ltd.,  
Bethlehem, Pa.  
Hyde Windlass Co., Bath, Me.

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85 Liberty St., New York City.

**STORAGE BATTERIES—See  
BATTERIES**

**STOVES**  
Stamford Foundry Co.,  
Stamford, Conn.

**STRAINERS (Oil)**  
Coen Co., Inc., 610 S. Broadway,  
Los Angeles, Cal.

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General Electric Co.,  
Schenectady, N. Y.  
Troy Engine & Machine Co.,  
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Westinghouse Electric & Mfg. Co.,  
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Taylor Instrument Co's.,  
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Cummings Machine Works,  
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Columbian Rope Co., Auburn, N. Y.  
Whitlock Cordage Co.,  
46 South St., New York City.

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Clark Tractor Co.,  
Battle Creek, Mich.  
Elwell-Parker Electric Co., The,  
4205 St. Clair Ave., Cleveland, O.

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ROPE (Transmission)**

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Clark Tractor Co.,  
Battle Creek, Mich.  
Elwell-Parker Electric Co., The,  
4205 St. Clair Ave., Cleveland, O.

**TRUCKS (Dump)**  
Clark Tractor Co.,  
Battle Creek, Mich.

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Schenectady, N. Y.  
Westinghouse Electric & Mfg. Co.,  
So. Philadelphia, Pa.

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Newport News Shipbuilding & Dry  
Dock Co., 233 Broadway,  
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Westinghouse Electric & Mfg. Co.,  
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DeLaval Steam Turbine Co.,  
Trenton, N. J.  
Newport News Shipbuilding & Dry  
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Sturtevant, B. F., Co.,  
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Westinghouse Electric & Mfg. Co.,  
So. Philadelphia, Pa.

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Hyde Park, Boston, Mass.

**VENTILATORS**  
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Oxweld Acetylene Co., The,  
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Dake Engine Co.,  
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Hyde Windlass Co., Bath, Me.

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Bethlehem Shipbuilding Corp., Ltd.,  
Bethlehem, Pa.  
Dake Engine Co.,  
Grand Haven, Mich.  
Hyde Windlass Co., Bath, Me.

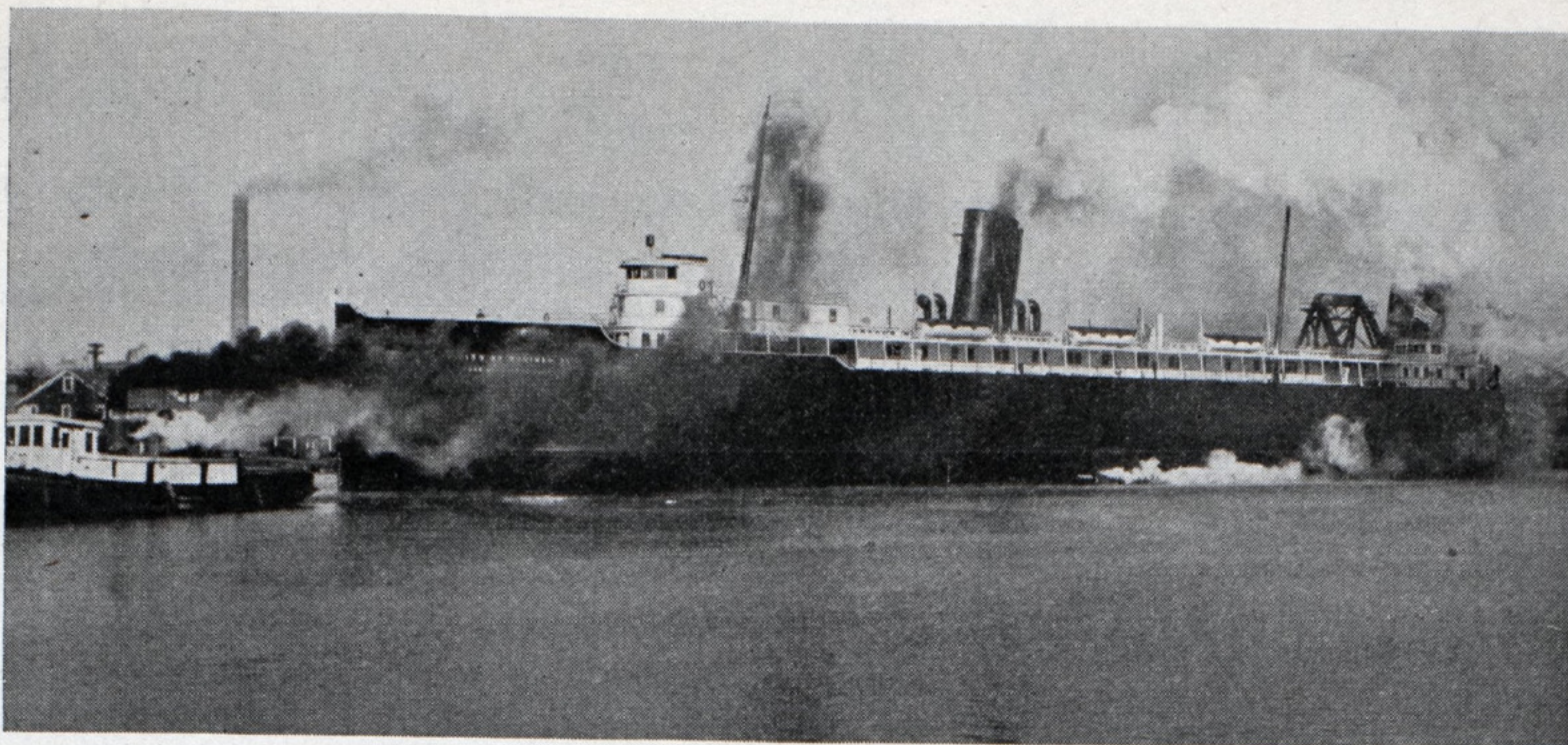
**WIRELESS MESSAGE SERVICE**  
Radiomarine Corp. of America,  
66 Broad St., New York City.

**WIRELESS SETS AND  
APPARATUS**  
Radiomarine Corp. of America,  
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See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above





HERE IS THE CITY OF SAGINAW 31, the turbo electric drive carferry built by us for the Pere Marquette Railway Company. When it comes to designing and building vessels our engineering organization, skilled workmen, and modern facilities guarantee satisfaction to the customer.

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MANITOWOC, WISCONSIN

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**Ship Compasses**  
**Navigational Equipment**

*Contracts a Specialty*

New York and Montreal

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Boilers, Tanks, Stacks, Structural Work and Castings

Boiler Repairing Promptly Attended to Day or Night

MARINE WORK A SPECIALTY

ELECTRIC WELDING

Works: 36-40 Illinois Street

- BUFFALO, N. Y.

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Evaporators—Feed Water Heaters—Extraction Steam Heaters—Generator Air Coolers—Lubricating Oil Coolers  
Steam, Air and Oil Separators—Filters—Strainers—Expansion Joints

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Marine Insurance Agents

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WERE SUPPLIED TO THE

## BYRD ANTARCTIC EXPEDITION

C. M. Lane Lifeboat Co., Inc.

Brooklyn, N. Y.



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For Sale and Miscellaneous Advertisements  
10c per word—minimum advertisement—\$3.00

Six words must be added for box address.

To insure insertion, advertisements must reach us by the 10th of the month.

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6c per word—minimum advertisement—\$3.00

Position Wanted Advertisements

4c per word—minimum advertisement—\$1.00

Please have remittance accompany order.

### For Sale

#### FOR SALE STEAM TUG "MONITOR"

70' x 15' x 9' draft, 45-tons gross, oak hull rebuilt 1918, main engine two-cylinder, vertical non-condensing, size 16 x 18, equipped with Scotch Marine boiler, working pressure 150 lbs. Blake steering engine, pumps, complete equipment. Price \$3000. Detailed specifications furnished on request. St. Lawrence River Power Company, Massena, New York.

### Position Wanted

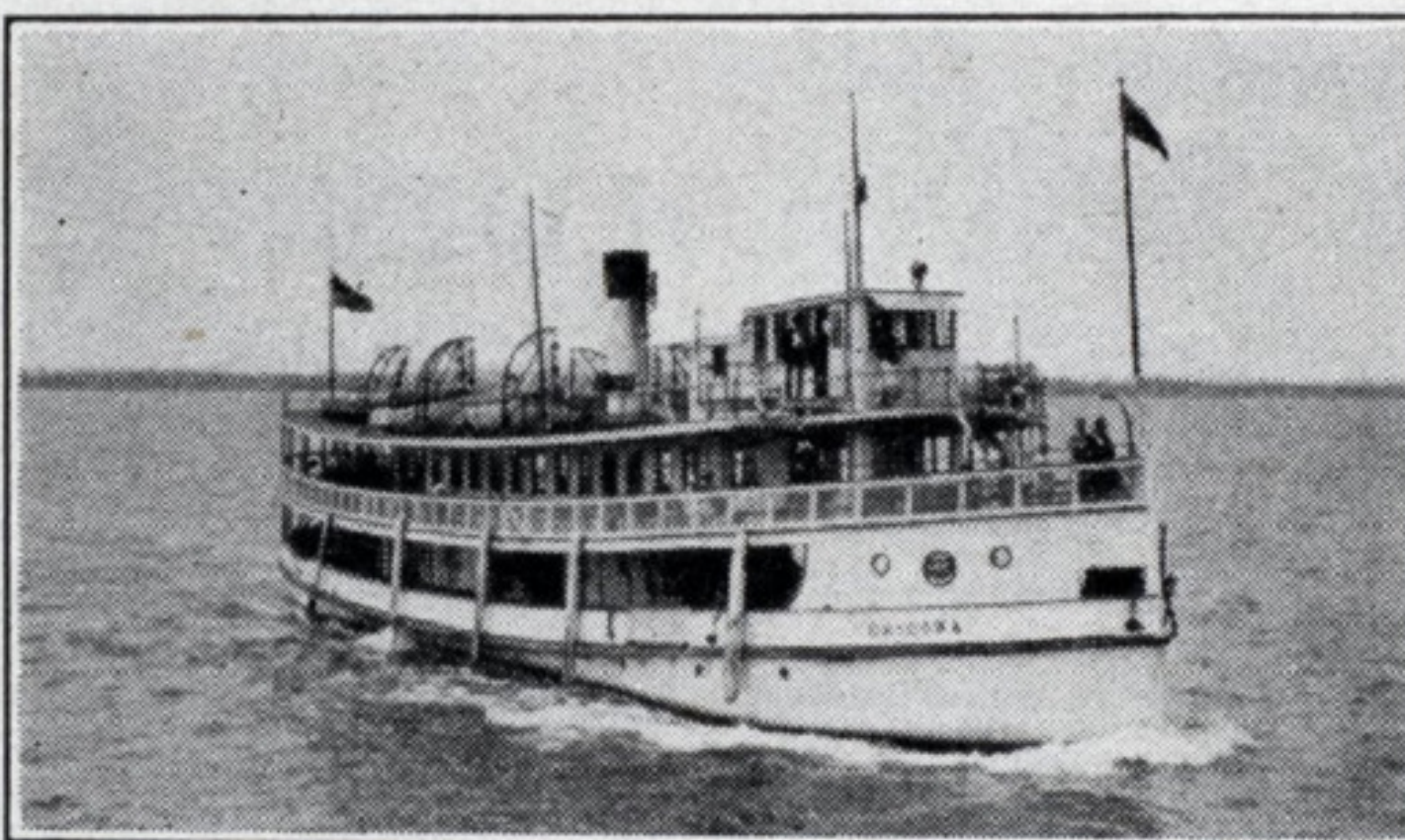
**WANTED: POSITION AS CHIEF ENGINEER** on Yacht, Passenger or Ferry boat. Will go anywhere. Have U. S. license for steam or diesel ships of any tonnage. Have a number of years experience at sea. Also shop experience installing engines. Will furnish best of references, as to ability and character. Write or wire Archie C. Rolfe, 1400 Washington St., Bath, Maine.

**POSITION WANTED: AS ASSISTANT TO** executive, junior executive, or representative of steamship company, vessel brokers, forwarding company, shipbuilding company, or manufacturer of marine equipment. Young man, single, thirty years old, graduate leading school of commerce, four years with Great Lakes passenger and package freight line, member family of steamship operators. Have traveled United States, Canada, European and Mediterranean countries and willing to go anywhere in those countries. Available immediately. Box 419, MARINE REVIEW, Cleveland, Ohio.

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#### LIGHTER FOR SALE

One new steel combination oil and deck lighter—80 x 26 x 6 ft. Charleston Dry Dock & Machine Company, Charleston, S. C.



**ON ACCOUNT OF DISCONTINUING AMUSE-**ment Park for subdivision will sell two steel Passenger Steamers—S.S. Bedell, length 104 feet, breadth 28 feet, draft 8 feet, 700 passengers. S.S. Chicora, length 124 feet, breadth 33 feet, draft 8 feet, 1000 passengers. Both in first class condition. Details on application—Erie Beach Park, Ltd., 402 Walbridge Building, Buffalo, N. Y.

### For Sale

**FOR SALE: MARINE ENGINES AND** boilers of all sizes; light draft wooden and steel tug boats for sale or charter; derrick boats, deck scows and lighters for sale or charter. Cowles Towing Co., Buffalo, N. Y.

#### FOR SALE STEEL TOW BARGE

"Swederope" 227' long, 38' beam, 19'6" deep. Detroit Sulphite Transportation Co., 9125 W. Jefferson Ave., Detroit, Mich.

### Wanted

**WANTED—FREIGHT AND PASSENGER** Steamer, about 150-foot keel, with Cabin accommodation and clearance between decks for autos. Pay cash. Owen Sound Transportation Co., Ltd., Owen Sound, Ontario.

#### WANTED

Small freight and passenger steamer, about 150' long of 400 ton capacity at draft of 10' Passenger accommodation desirable but not essential. Box 420, MARINE REVIEW, Cleveland, Ohio.

### TO OUR SUBSCRIBERS

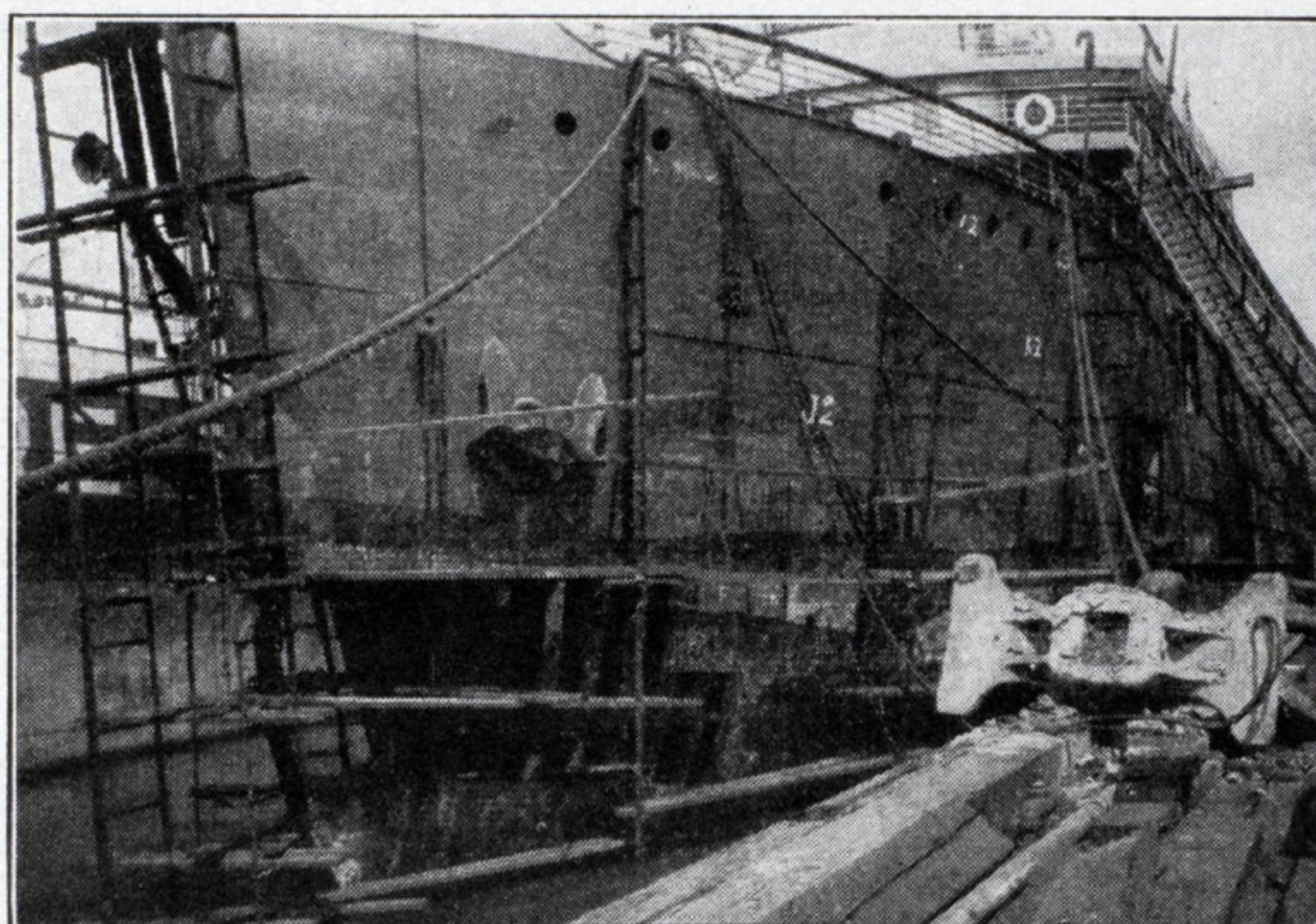
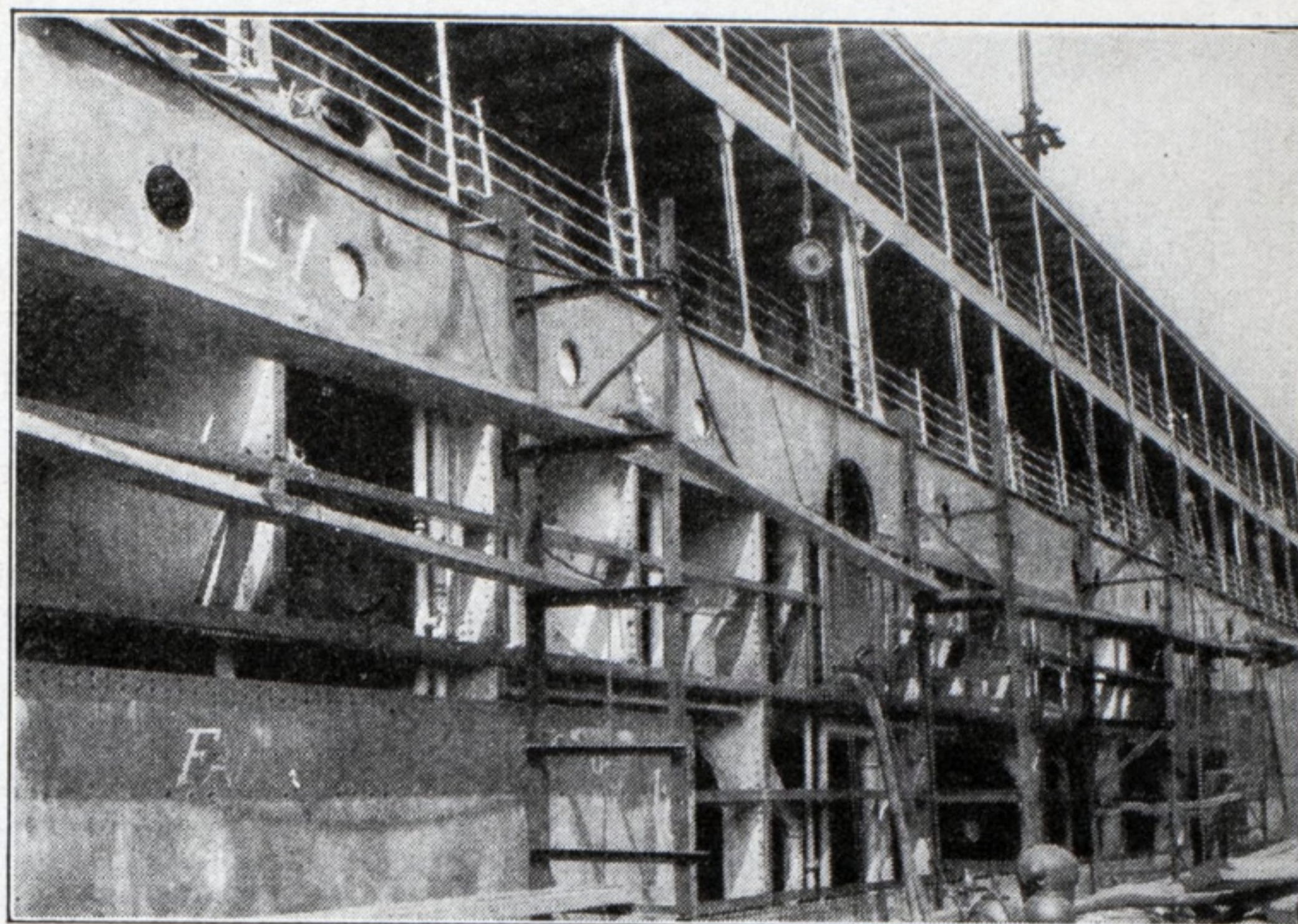
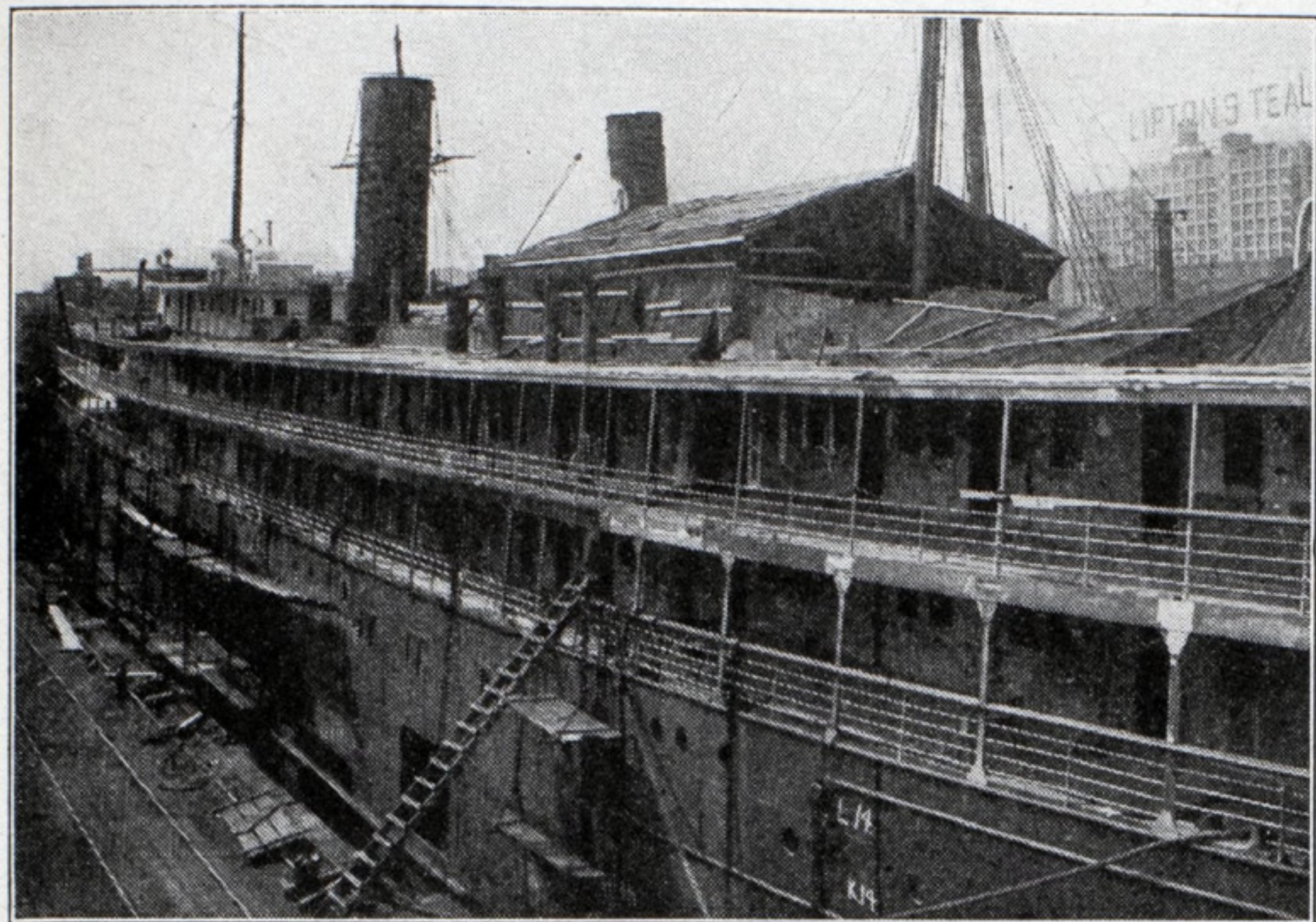
The classified section of MARINE REVIEW is for your convenience—its value is proving worthwhile to everyone who uses it to buy and sell.

If you want to buy or sell ships or marine equipment—need a man for your organization—make it known to the entire marine industry through the use of classified advertising in MARINE REVIEW.

Mail copy for your advertisement in the February issue today, so it reaches us before January 20.



# *Four "Earning Days" Saved for the S. S. Fairfax*



WHEN United agreed to recondition the Merchants and Miners liner *Fairfax* in 45 days it expressed also its determination to better the contract time if possible. Keeping in mind that a ship earns no money in a repair yard, United exerted every effort to save time. As a result, the *Fairfax* was returned to her owners four days ahead of schedule. Those four days became earning days, for they enabled the *Fairfax* to make a voyage that had not been counted on. It is noteworthy also that United's bid was 15 days under the next low bid. But that is the sort of service that is standard at the Fletcher Plant—where the *Fairfax* was repaired—and at United's four other plants—Crane, Morse, Shewan and Staten Island. The reason for this policy of superior service is obvious—the best customer is a satisfied customer.

## UNITED DRY DOCKS

Incorporated

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New York

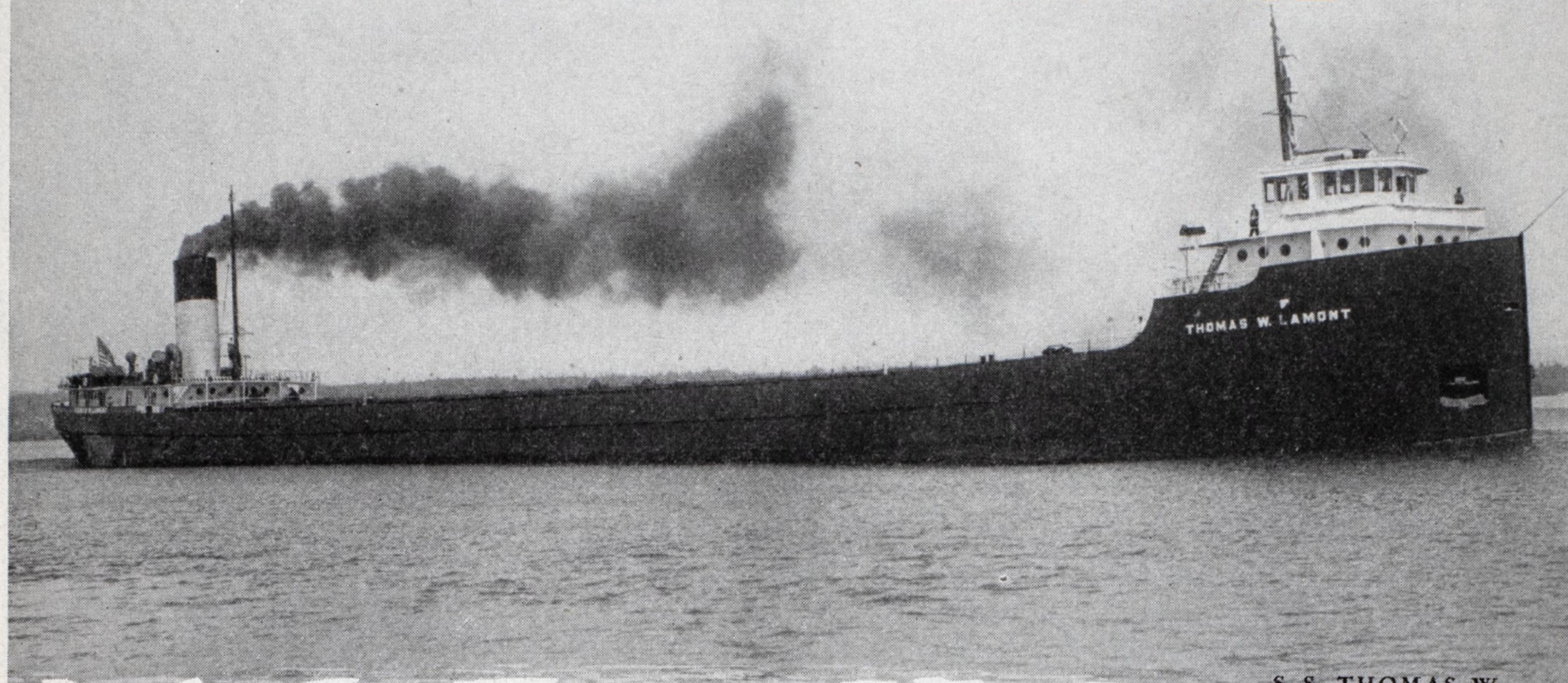


MARINE REVIEW—January, 1931



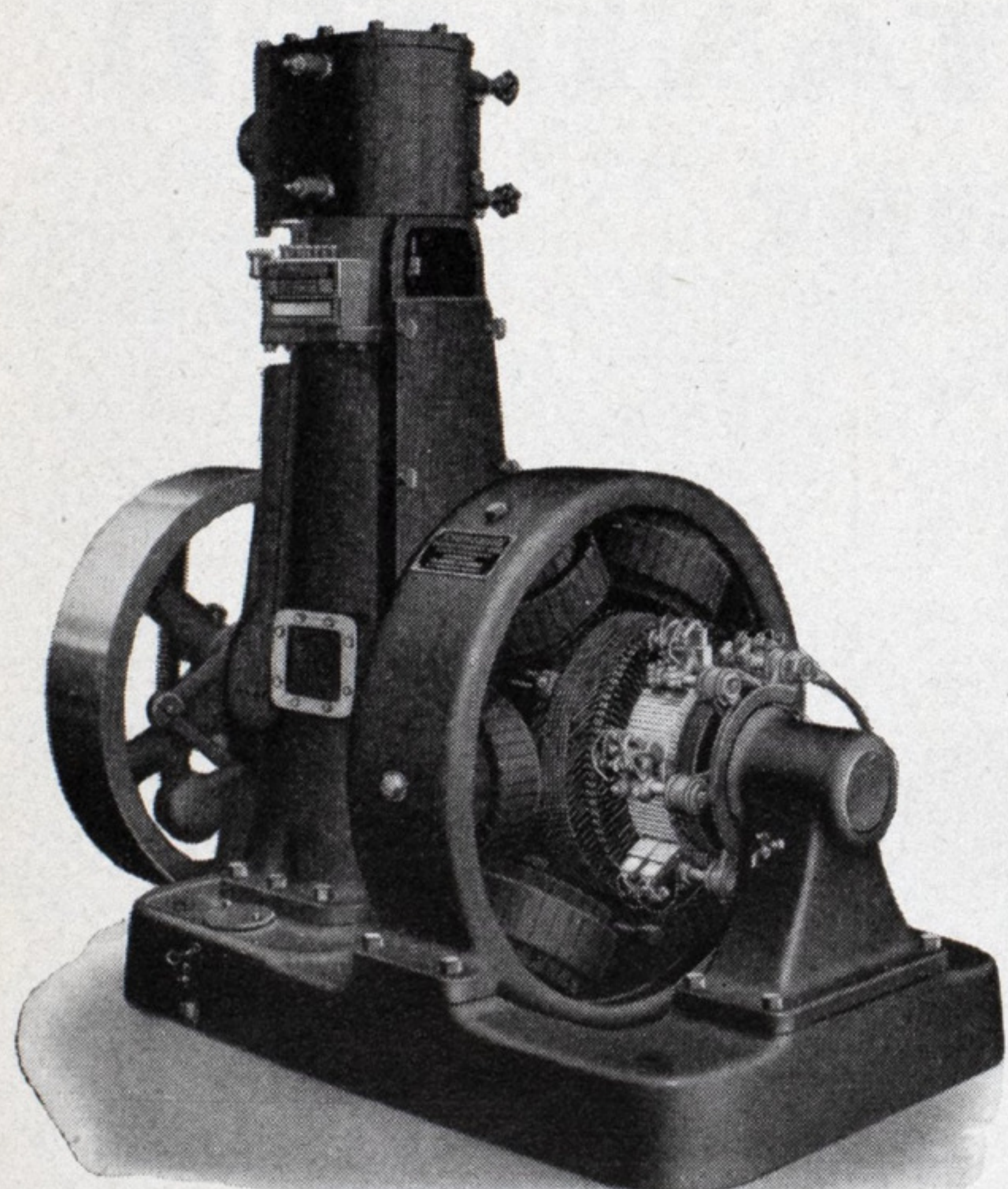
*Engine Generating Sets...*

# ARE MORE ECONOMICAL AND MORE RELIABLE



S. S. THOMAS W. LAMONT built by Toledo Shipbuilding Company for Pittsburgh Steamship Company and equipped with 3 Engberg 15 K W. Improved Marine Generating Sets.

24 Hour Full Load Continuous Operation for Full Seasons  
of 6 to 9 Months Without a Shutdown Is Not Unusual



SEASON after season they are used with practically no attention and maintenance. This inherent reliability of engine-driven units has been brought to its maximum in Engberg because every part of the entire machine has been constantly improved and is the result of forty years marine specialization.

Operators on river, lake and ocean who are materially reducing operating expense consistently install Engberg. They know from actual operating results that these machines will cut their costs.

Bulletin No. 1901 which fully describes and illustrates the many valuable features will gladly be sent on request and without obligation.

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VERTICAL AND HORIZONTAL STEAM ENGINES » GENERATING SETS  
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# TROY - ENGBERG

MARINE GENERATING SETS AND ENGINES

Pay for themselves by low cost dependable operation





# 15 men on a SINKING SHIP rescued by a STANDARD

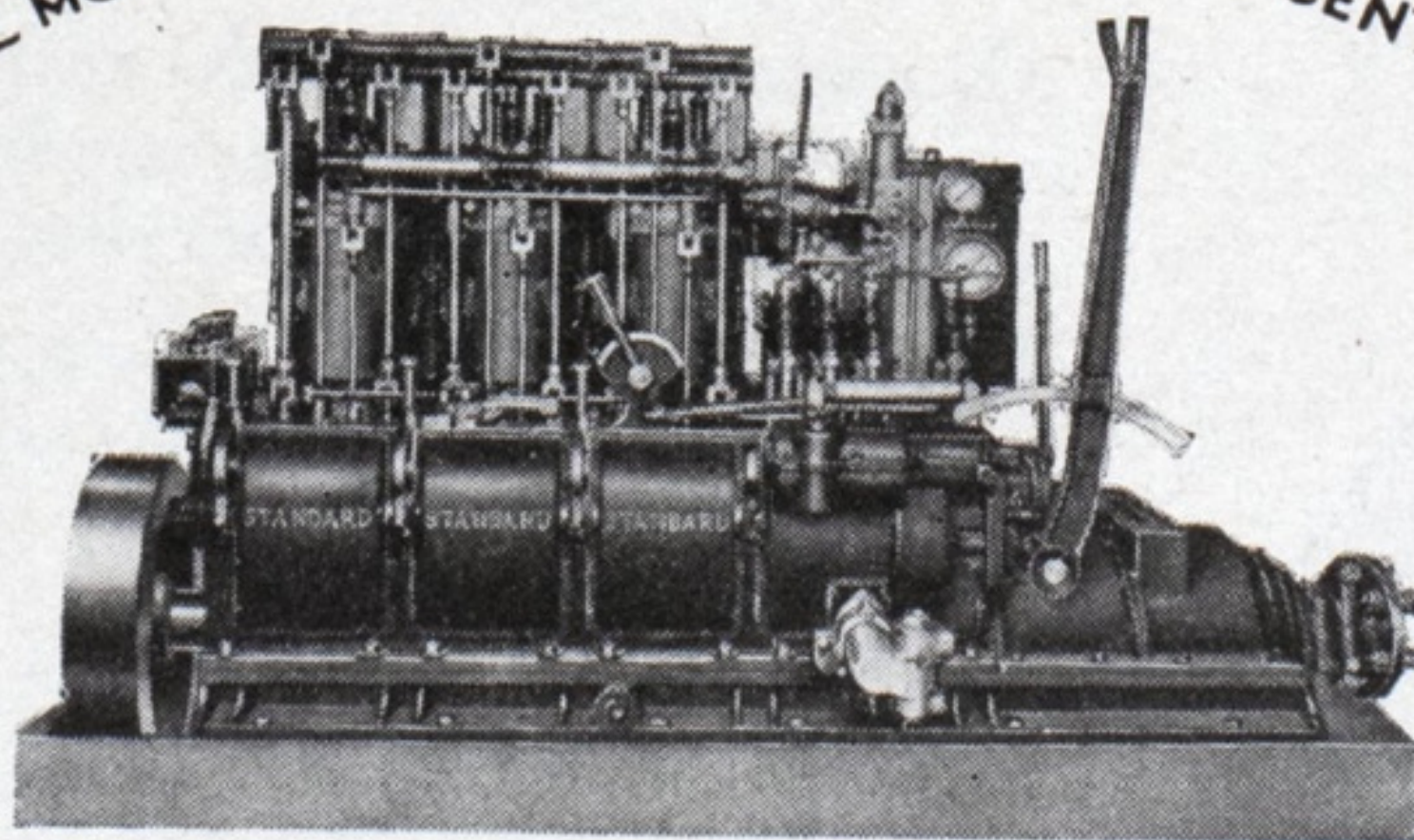
## DIESEL ENGINE

The Schooner Scandia piled up on a knife-like reef in the North Pacific in a cold, black gale and was rapidly tearing herself to bits when the fishing boat, Duncan No. 1, heard the S.O.S. and sped to the rescue.

In a pall of blackness, driving snow and a terrific sea, the Duncan No. 1 picked her way among the reefs, fought the waves that all but swallowed her and brought fifteen men to safety.

Honor the skipper, his crew and his craft . . . but honor, too, the sturdy Standard Diesel 3 cylinder engine in the fishing boat. The consistent two-

ALL MODELS DIRECT REVERSIBLE • NO DEAD CENTER



The Standard Diesel line, includes 3, 4, 6 and 8 cylinder full Diesel engines ranging from 50 to 500 H. P. All models direct-reversible, even 3 and 4 cylinder engines, and all capable of ample overload capacity.

fisted power of the engine, coupled with the direct-reversible feature which permitted quick maneuvering, carried the fishing boat in and out of the jagged jaws of death.

Standard is the only Diesel that gives you direct-reversing in three and four cylinder engines. No other engine can—it's a patented feature controlled exclusively by Standard. Write for descriptive literature and quotations on your specific requirements.

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A few good territories open—See us Motor Boat Show—Booth 407

# "STANDARD" DIESEL ENGINE



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REGARDLESS the size of the job—whether it is serious bottom or bow damage, routine underwater work or voyage repairs, the resources, efficient organization and unlimited facilities at NEWPORT NEWS offer singular service for the repair of ships.

These facilities, which include three large graving docks, foundry and forge shops, insure immediate attention—savings in time and labor and a speedy return of the vessel to service.

The ideal climatic conditions are also a big advantage that must be taken into consideration . . . There are no winter handicaps at NEWPORT NEWS.

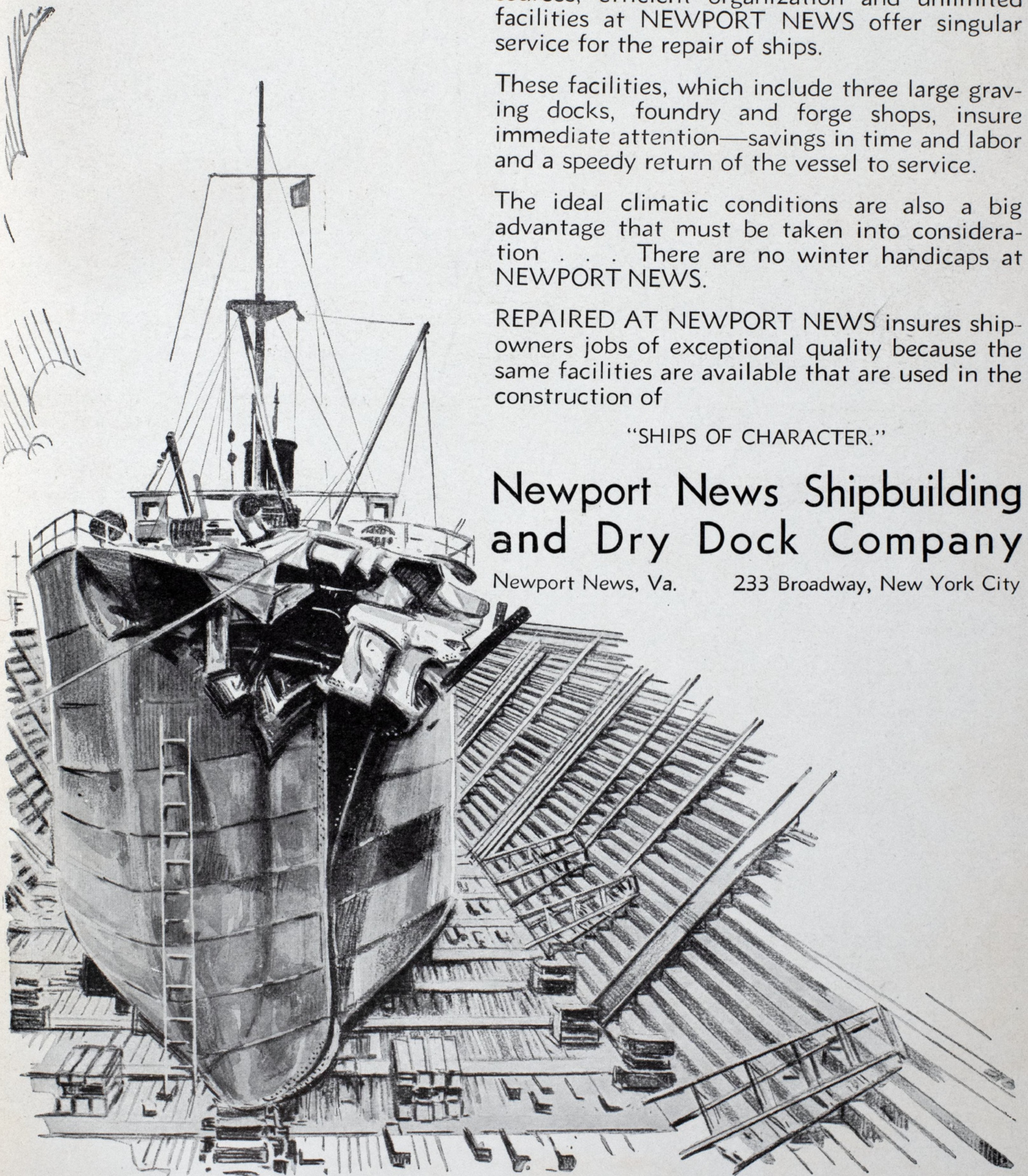
REPAIRED AT NEWPORT NEWS insures ship-owners jobs of exceptional quality because the same facilities are available that are used in the construction of

"SHIPS OF CHARACTER."

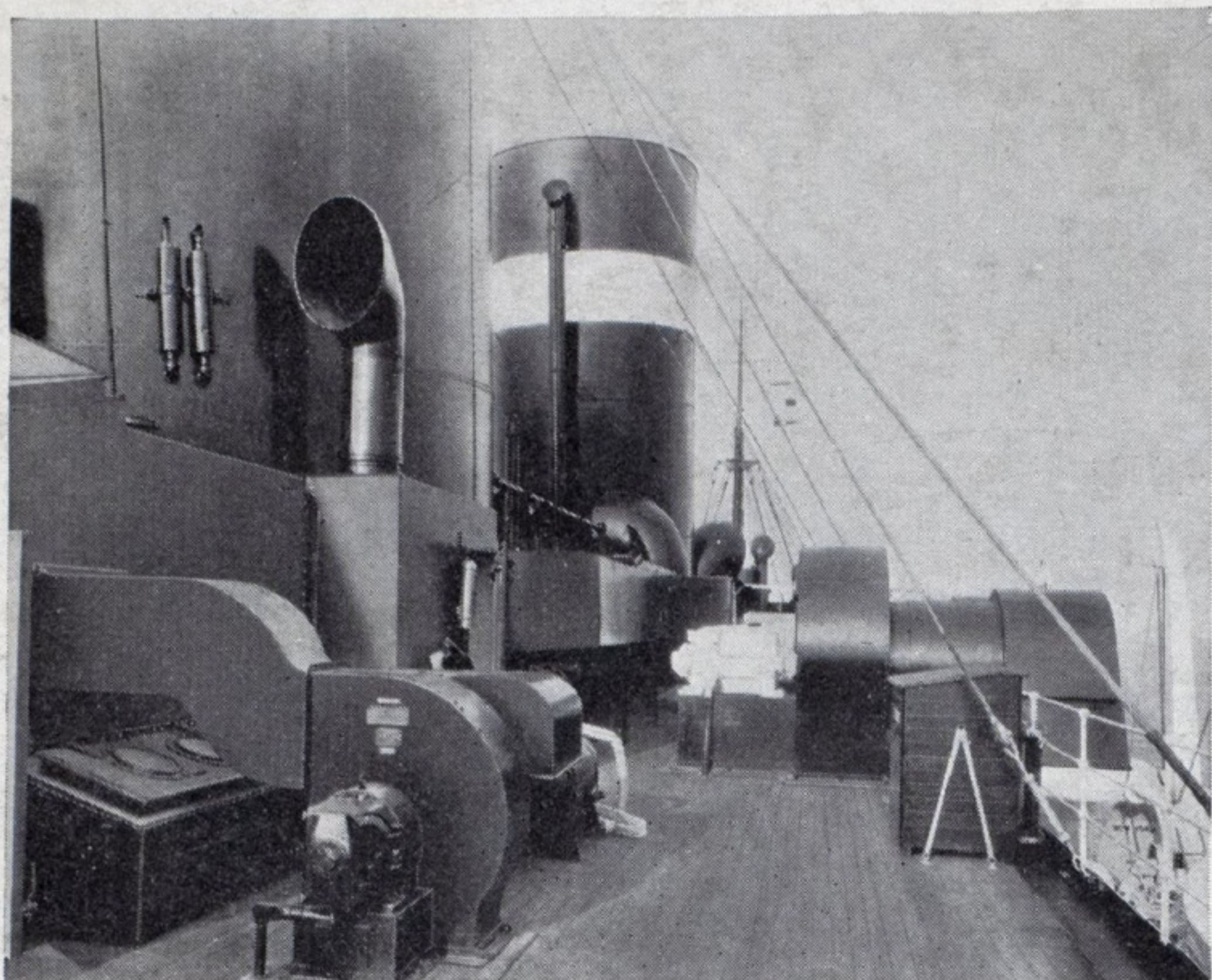
## Newport News Shipbuilding and Dry Dock Company

Newport News, Va.

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When your passengers get up in the morning are they refreshed from a good night's sleep? If they have been sleeping on the boats equipped with Sturtevant ventilating fan, the chances are that the fresh cool sea air has filled them with new zest and vigor.

Sturtevant Ventilating equipment has been the standard by which all other systems have been measured for over fifty years. They are both quiet and efficient. We put into them the experience gained from sixty-six years of building air handling equipment.

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If You Want The Best Specify

# Hyde

S. S. "A. F. HARVEY" owned by Pittsburgh Steamship Co. and built by Great Lakes Engineering Works.

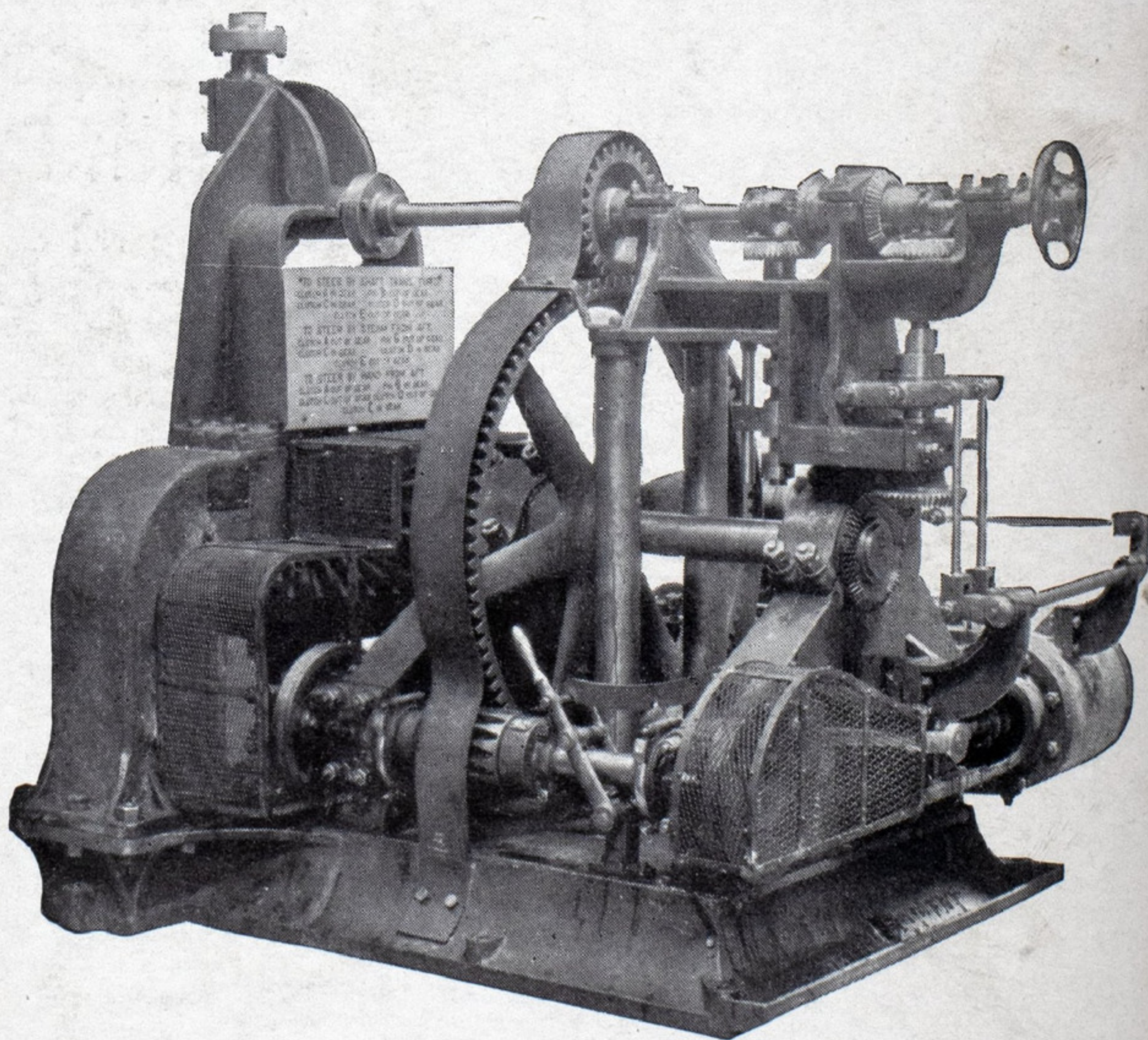
S. S. "B. F. AFFLECK" owned by Pittsburgh Steamship Co. and built by Toledo Shipbuilding Co.

S. S. "S. T. Crapo" owned by Huron Transportation Co. and built by Great Lakes Engineering Works.

These three fine new boats  
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Quadrant Type  
Steering Gear  
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HYDE Quadrant Type Steering Gear

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